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Equitable access to basic utilities: Public versus private provision and beyond

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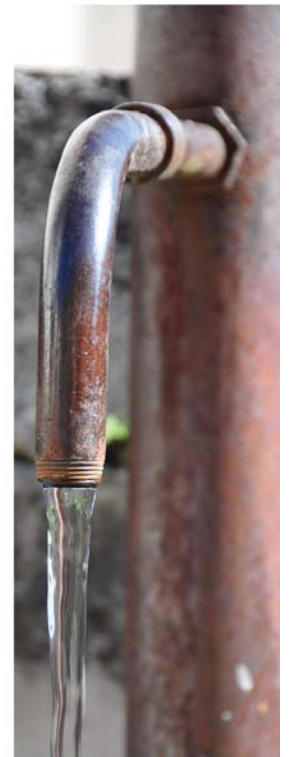
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Poverty In Focus

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Equitable Access to Basic Utilities:
Public versus Private Provision and Beyond

FROM THE EDITORS

Poverty in Focus is a regular publication of the **International Policy Centre for Inclusive Growth (IPC-IG)**. Its purpose is to present the results of research on poverty and inequality in the developing world. Support is provided by the Swedish International Development Cooperation Agency (Sida).

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* We express our sincere condolences on the recent passing of Professor Peter Townsend, who was a member of the Advisory Board.

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IPC-IG is a joint project between the United Nations Development Programme and Brazil to promote South-South Cooperation on applied poverty research. It specialises in analysing poverty and inequality and offering research-based policy recommendations on how to reduce them. IPC-IG is directly linked to the Poverty Group of the Bureau for Development Policy, UNDP and the Government of Brazil.

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Providing universal access to basic utilities is justified on human rights grounds and also because of the positive externalities involved. Adequate provision of water, sanitation and electricity contributes to the achievement of the other Millennium Development Goals (MDGs). Access to these services, however, is still unequal in the developing world. Services do not adequately reach the poor. This *Poverty in Focus* brings together a mix of policy issues and some country experiences.

Degol Hailu and Raquel Tsukada provide an overview of the broad challenges involved in making access to basic services equitable and universal.

Hulya Dagdeviren and Simon A. Robertson point out the difficulties of expanding utility networks in slum areas, which include technical barriers and a lack of land and housing tenure. They make a case for stronger public interventions.

Kate Bayliss argues that the allocation of demand and investment risks during privatisation in Sub-Saharan Africa is distorted. This is because the risks are borne by governments and end users instead of the private contractors.

David Hall and Emanuele Lobina provide a critique of both the investment potential of the private sector and cost recovery schemes in the provision of sanitation services.

Ashley C. Brown discusses the externalities involved in supplying basic infrastructure to those who can least afford it. He argues that, contrary to established views, cross-subsidy schemes actually benefit all users and not only the targeted population.

Alison Post emphasises the benefits of water metering but highlights problems of implementation and poor design in Argentina.

Degol Hailu, Rafael Osorio and Raquel Tsukada examine the reasons for the privatisation and then renationalisation of the water supply in urban Bolivia.

Andre Rossi de Oliveira explores water privatisation in Brazil. He argues that the expansion of coverage has stemmed mainly from high levels of investment by private operators.

Suani Teixeira Coelho, Patricia Guardabassi, Beatriz A. Lora and José Goldemberg note that geographically isolated communities without access to electricity grids, such as those in the Amazon, can be served by renewable energy sources.

Luc Savard, Dorothée Boccanfuso and Antonio Estache present the findings of a general equilibrium model that assesses the impact of electricity price changes on the poor in Mali and Senegal.

Joana Costa, Degol Hailu, Elydia Silva and Raquel Tsukada empirically show that water provision reduces the total work burden on women in rural Ghana.

Nitish Jha conducts a sociological analysis of access to water and sanitation in India, emphasising the challenges encountered in community-based schemes.

Julia Kercher explains why and how a human rights framework must guide the design and implementation of private utility provision.

We hope that this collection of articles will contribute to the discussion of how to provide vital infrastructure services more equitably.

This *Poverty in Focus* is the result of an International Workshop on Equitable Access to Basic Services held on 5 December 2008 in São Paulo, Brazil. IPC-IG and the David Rockefeller Centre for Latin American Studies at Harvard University (DRCLAS) jointly organised the workshop. We gratefully acknowledge DRCLAS' contribution.

The Editors

Equitable Access to Basic Utilities: An Overview

by Degol Hailu and Raquel Tsukada
International Policy Centre
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The Millennium Development Goal (MDG) for water is to halve the proportion of people without access to safe drinking water by 2015. The urgency of meeting this target is reflected in the UNDP's *Human Development Report 2006*, which warns that more than 1 billion people globally are living in extreme water deprivation. Over 40 per cent of the world's population also lack access to safe and clean sanitation services. The report also notes that "not having access to water and sanitation is a polite euphemism for a form of deprivation that threatens life, destroys opportunity and undermines human dignity" (UNDP, 2006, p. 5).

Similarly, about 1.6 billion people worldwide do not have access to electricity. Of these, 706 million are in South Asia and 554 million in Africa, despite large mining and industrial conglomerates enjoying cheap access to an enormous supply of electricity (see McDonald, 2009). The figures indicate how inequitable is access to basic utilities, both across and within countries.

Communities with the least access to utility infrastructure often live in slum dwellings and remote areas. Rapid urbanisation and informal settlements pose particular problems for water provision. As Hulya Dagdeviren and Simon Robertson report, the number of residential water connections has fallen in most unplanned urban settlements in the past decade. The authors also highlight the obstacles that large-scale private providers cannot resolve without imposing exorbitant tariffs to cover costs. Those obstacles are two-fold in origin. First, technical difficulties such as the topographical location of informal settlements pose physical challenges. Second, lack of tenure for land and housing creates uncertainties. In these

cases, market-oriented policies are not appropriate means of providing access to water in the slums of the developing world. They note that "there are serious doubts about the potential gains of both privatised network utilities (where planning and development challenges persist) and small-scale service providers (because of pricing and quality issues). Ultimately, these concerns can be resolved by investing in the expansion of the public water and sanitation network."

While access to basic services should be a human right, it is also a public good with numerous positive externalities. The impact on the other MDGs, for instance, is clear. Making water, sanitation and electricity available empowers women by freeing them from the burden and dangers of carrying water, often over long distances, and allows them more time to attend school. As Joana Costa et al. show, the provision of utilities in rural Ghana reduces the burden of unpaid work. In addition, for women already engaged in remunerated activities, work time seems to have increased, which in turn has a gender-empowering impact. They stress that "additional public policies are needed to achieve that goal [reducing work burden], especially policies related to educational training and childcare facilities".

The policy challenge that developing countries face is to increase the poor's access to utilities while simultaneously reaping the benefits of the positive externalities. For the past two decades, policy has focused mainly on private investment and foreign capital. Just as the "market failure" argument gave rise to public ownership of certain enterprises, so the "government failure" reasoning paved the way for privatisation. The latter was supported by developments in economics, which emphasised public

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choice, property rights and principal-agent theories as justifications for private ownership.

A fiscal case was also made: gains from the sale of enterprises, savings from subsidising unprofitable companies and new tax revenues from the privatised firms would improve government budgets. Additionally, privatisation was seen as a permanent shift to a market economy—what the World Bank called “lock-in” in the 1990s. Unlike, say, changes in interest rates or exchange rates, which can be reversed overnight, privatisation was seen as a commitment to reform, one that sent the right signals to investors.

The above arguments are well captured in a World Bank (2004) research report, which stated that:

“In a globalised economy, poorly performing state-owned infrastructure providers were increasingly seen as constraining economic growth and undermining international competitiveness. Developing countries simply could not continue to absorb the fiscal burden of these enterprises. Around the world, it became evident to policymakers that the problems of public enterprises could be solved only by implementing radical structural changes and realigning the roles of the government and the private sector” (p.35).

Under utility privatisation and commercialisation schemes, governments usually retain ownership of assets while inviting private contractors to run the operations and provide management services. While there are plenty of cases in which publicly managed utilities are marked by poor maintenance, wastage and uncollected bills, social welfare goals such as increasing the poor’s access to basic services can be organised successfully by public initiatives.

As Vickers and Yarrow (1991, pp. 113–114) note: “public ownership may have the advantage if externalities are larger and the pursuit of personal agendas is more constrained, for example by a well-functioning political system.” For instance, large private enterprises can be highly inefficient, leading to a concentration of market structures.

This is mainly related to a lack of competing firms and scarce capital. Such outcomes are confirmed by private investors’ interest in sectors with less competition, such as utilities.

The debate on private versus public provision of utilities is complex, but the guiding principle for the kind of provision preferred must be the *initial level of access* to water, sanitation and electricity. Where access is already high in developed and middle-income countries, privatisation may yield productive and dynamic efficiencies.

Private providers have incentives to improve overall performance through new techniques and novel management processes. Where access to utilities is low and the focus is on increasing coverage of the poor in low-income countries and neighbourhoods, public provision makes sense. This is because of problems associated with affordability, how much cost recovery can be pushed, and regulatory capacity. The persistent challenge, however, is financing investment outlays. The options are reducing system losses such as water leakages; improved billing; domestic resource mobilisation; and external financing (both donor and private bond/equity financing).

Historical experiences are particularly enlightening. Privatisation had been relatively successful in the United Kingdom and the United States, because these countries embarked on private utility provision after achieving 100 per cent access to water and electricity by the 1980s. As David Hall and Emanuele Lobina observe, “the sewerage systems in Europe, the United States and Japan were not developed through full cost recovery from users; they were paid for by distributing the costs among the public, using taxation and cross-subsidy.”

The overall evidence is that privatisation of utilities is not a solution where initial access is low and the objective is the coverage of the poor. This point is made in the article on Bolivia by Degol Hailu et al.

The private concessionaire and the government agreed on coverage targets to provide universal access in the city of La Paz and 82 per cent

coverage in El Alto by 2001. The poor’s access to water connections increased, but the private company could not meet the targets. Inevitably, the limits of cost recovery and profitability had been reached. The tariff increases needed to connect the additional poor consumers were so high that they sparked public outrage.

Similarly, as Alison Post reveals, private concessionaires in Argentina entered into a contract with the government to increase water metering up to 100 per cent. Fees were imposed for the installation of the meters and tariffs were increased. The result was intense public protest. In Mali and Senegal the poor have not benefited from privatisation, simply because they were not connected to the grid in the first place. The tariff hikes after privatisation affected them indirectly as a result of economy-wide effects, a point stressed by Luc Savard et al. The concessions in Argentina, Bolivia, Mali and Senegal have all been terminated.

Contract cancellations and renationalisation are often the result of a policy that transfers risk to governments and end users. As Kate Bayliss argues, the focus in Sub-Saharan Africa has been to transfer investment, demand and currency risks in order to attract private investors. She argues that “in industrialised economies, the transfer of risk to the private sector is considered essential if efficiency gains from privatisation of the delivery of basic services are to reach end users. In SSA [Sub-Saharan Africa], however, the emphasis is on reducing the risks faced by the private sector in order to encourage private investment.” The upshot is always exorbitant tariffs and neglected infrastructure. This contrasts with the standard practice in developed countries, where risk is usually transferred to private providers at the time of privatisation.

One reason why private participation in the water sector has been successful in Brazil seems to be the transfer of investment risk. Contracts with the various government entities at the state and municipal levels clearly outlined the investment obligations of the private operators, particularly in low-income areas.

As Andre Rossi de Oliveira points out, the private operators had invested about US\$500 million by 2004. He underscores that “the positive outcomes in Brazil are related to contract design... Most contracts stressed investment obligations, something relatively easy to monitor.”

The limitations of public and private provision to increase the poor’s access to utilities have enhanced the role of community and small-scale water providers. The absence of economies of scale, however, means that water prices are typically high. Maintenance facilities are inadequate and there is no proper accountability for service interruption.

The quality of small-scale providers’ supply is not always assured. Moreover, it is not easy to regulate community and small-scale providers, and neither is it possible to engage in cross-subsidy. In India, as Nitish Jha argues, community-based water provision schemes are often poorly designed and implemented. Because of a lack of social cohesion, vulnerable groups are often excluded from decision-making processes.

What are the lessons? The debate should move away from a narrow focus on public versus private to analysis of the constraints on public intervention, possible improvements, and the potential for alternative provision under a poverty reduction framework. Three issues seem to matter.

First, where initial utility coverage is low, subsidy and cross-subsidy schemes are the best alternative. As Ashley Brown reminds us, another externality comes from connecting the poor to infrastructure networks through cross-subsidies.

All consumers benefit if the cross-subsidy is designed in such a way that the poor cover the variable cost and make some contribution to fixed costs. Income-based targeting schemes, for instance, with a mix of some consumption-, age- and geography-based targeting of beneficiaries, can be sustainable.

Second, decentralised and locally based utility provision has been promising in the electricity sector. Geographically isolated communities, such as those in

and around the Amazon, have benefited from locally managed electricity generating facilities. The difficulty has been expanding the traditional grid system in the densely forested areas. As Suani Teixeira et al. report, following the ambitious Light for Everyone programme in Brazil, local renewable energy-generating services using photovoltaic, small-scale hydropower and biomass sources have become viable solutions.

Third, where initial access to utilities is high and privatisation is considered, better contract design is needed to take account of political and social considerations. Risk must be transferred to private providers, not to governments and consumers. As Julia Kercher explains a human rights framework must guide the design and implementation of private provision based on the principles of availability, accessibility, acceptability and its quality.

Finally, utility provision can only succeed if effective regulatory and institutional capacities are put in place to enforce contracts and ensure the efficiency of cross-subsidy mechanisms. Regulation is most effective when laws and institutions are stronger and are free of political influence (see Estache et al., 2003). Regulation is also country-specific, while technical skills, legal frameworks and dissemination of information to the wider public are essential. ■

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by Hulya Dagdeviren
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Access to Water in the Slums of the Developing World

The increase in urbanisation and its disproportionate concentration in informal settlements pose problems for the expansion of water and sanitation services.

Forced evictions are still used extensively, especially in Africa and Asia, where over 14 million people were evicted between 1998 and 2006.

The problem of inadequate access to safe water is nowhere more pressing than in the slums of the developing world. Most countries in which a large proportion of the urban population live in squatter settlements are unlikely to meet the water-related Millennium Development Goals (MDGs). This article argues that market-oriented policies make little, if any, difference in those circumstances.

Trends in Slum Development

About a third of the world's urban population lived in slums in 1990, and the total number of slum dwellers might rise to 1.5 billion by 2020. Slum growth has been particularly marked in Africa where, on average, more than 70 per cent of the urban population live in informal settlement areas.

Public policies towards slums are highly politicised. They are influenced by factors such as the strength of non-governmental organisations (NGOs) and other social groups, as well as by the politics of slum management. So far, governments have dealt with squatter settlements and the associated problems in three ways:

- (i) clearing slums through forced or legal evictions;
- (ii) applying public policies that range from benign neglect to occasional interventions; and
- (iii) regularising settlement conditions.

Forced evictions are still used extensively, especially in Africa and Asia, where over 14 million people were evicted between 1998 and 2006 (UN-Habitat, 2007).

Access to Water in the Slums of the Developing World

The increase in urbanisation and its disproportionate concentration in informal settlements pose problems for the expansion of water and sanitation services. Table 1 provides data on access to safe water in the countries with the largest slum populations in Asia and sub-Saharan Africa, where conditions are particularly drastic.

UN-Habitat's original database, which includes a larger number of countries, shows that urban access to improved water facilities declined in more than a third of African countries during the period 1990–2004. In many cities, there is a notably low rate of access to water through private household connections from network infrastructure. More than two-thirds of the urban population in Africa depend on water from non-residential connections. In half of the African countries, the share of residential water connections either declined or was static.

Table 1
Access to Safe Water in Countries with the Largest Slum Population (%)

	Slum population to urban population ratio		Urban population without access to safe drinking water		Urban households without residential piped water supply	
	1990	2001	1990	2004	1990	2004
Asian countries						
Afghanistan	99	99	90	37	94	85
Nepal	97	92	5	4	59	48
Bangladesh	87	85	17	18	72	76
Pakistan	79	74	5	4	40	51
India	61	56	11	5	47	53
Sub-Saharan African countries						
Ethiopia	99	99	19	19	98	68
Chad	99	99	59	59	90	90
Tanzania	99	92	15	15	67	57
Niger	96	96	38	20	81	65
Mozambique	95	94	17	28	67	82
Malawi	95	91	10	2	56	71
Mali	94	93	50	22	92	71
Uganda	94	93	20	13	76	93
Madagascar	91	93	20	23	72	84
Sudan	86	86	15	22	25	54

Source: UN-Habitat (2007).

Lack of access to safe water in general, and lack of residential supply in particular, is positively correlated to the proportion of the population living in unplanned settlement areas. An important trend in Africa, and to some extent in Asia, is that improvements in access to safe drinking water were frequently accompanied by a decline in residential connections during the period 1990–2004. In other words, more people now rely on public standpipes, boreholes, “protected” wells and springs.

Challenges for Public Utilities in Improving Access to Safe Water in the Slums

1. Technical difficulties of infrastructure extension: The supply problems facing public utilities are exacerbated by a number of barriers that make it impractical to build the network in some slum areas. The most important are:

- The topographical location of settlements in previously unused land such as hills, ravines, flood plains and desert land.
- The physical conditions of the settlements, which are marked by a random and haphazard development pattern and overcrowding.
- The quality of the materials used to build housing units, such as thickened mud, plant leaves and stems, tin and plaster boards, which are unsuitable for permanent water pipes and taps.

2. Lack of tenure for land or housing: the result of the invasion of public or private land, can pose a significant obstacle to the provision of water services. This is because provision by utilities and the extension of water services by local authorities often depend on the existence of legal tenure for property.

These two issues are challenging for public policy. Overcoming the difficulties associated with the settlement conditions outlined in (1) requires relocation of slum dwellers to more suitable areas and enforcement of housing standards. Granting full tenure in order to tackle the problems associated with the insecurity of tenure outlined in (2) may raise property prices and encourage the development of new slum areas. Dwellers may sell their

plots and squat elsewhere. The policy may benefit the non-poor, especially property merchants. Opposition to redistributive policies, involving relocation and/or the formalisation of slums, can be testing for governments.

Can Privatisation of Utilities Provide an Answer?

Thus far, policies geared to improving access to water have emphasised the importance of market-oriented solutions (World Bank, 2004). The shift towards private or commercialised services has meant that direct public investment in the water sector has declined. But the resulting gap has not been offset by private sector investments (Estache, 2006). Where public utilities have been privatised there have been numerous problems related to cost recovery, affordability and regulation of services. Private service providers have not performed better than public operators. Nonetheless, though the outcomes have been disappointing, the drive for privatisation continues with renewed emphasis following a short period of critical reflection.

The potential for privatisation is even more limited in countries where a significant proportion of the urban population live in squatter settlements. In these settlements, the multifaceted nature of the problems (such as tenure, technical difficulties in building water infrastructure, widespread poverty, high population turnover) seriously constrain the capacity of privatised utilities.

Types of Informal Water Services in the Slums and Their Limitations

In the middle- and upper middle-income countries, slums are often supplied from the public network. In low-income economies, however, the provision of water in informal settlements is dominated by community-managed water schemes and small-scale private suppliers.

Community managed water schemes:

Typically, these are facilitated by NGOs that help the community to build a shared water point such as water kiosk, which is then managed and run by people employed by the community’s members. These small-scale projects are crucial to the provision of water in the absence of other alternatives, but they

are not problem-free. Water charges are higher and cross-subsidisation is not feasible because the projects do not benefit from economies of scale. Their long-term maintenance can be difficult because of a lack of social cohesion, financial resources, and technical and management capacity.

Small-scale private water suppliers: Some 50 per cent of the urban population in Africa obtain water from small suppliers. These include water tankers, street vendors and other water re-sellers (that is, households with a piped supply or wells in their yards selling water to those without access). Their services are problematic for three reasons. First, their prices are much higher, partly because they lack economies of scale. Second, the quality of the water is highly dependent on the quality of sanitation services in the locale. Finally, where regulation is absent (which is often typical), prices may be subject to collusion. While it is desirable to regulate small, private suppliers, it is intrinsically difficult and costly to do so because of their size, variety and number.

Policy Recommendations

There are three fundamental reasons why governments should play a more active role in the provision of water and sanitation. First, universal access to safe drinking water has positive externalities in the form of lower rates of illness and mortality, an associated increase in productivity, and reduced medical costs. The returns from universal water coverage can be significant, varying from US\$4 for each dollar invested in sub-Saharan Africa to US\$17 in Latin America (Table 2). Second, privatisation is not an option in poor and low-income areas where services are not profitable.

Table 2
Cost-Benefit Ratio of Achieving Universal Water Coverage

Sub-Saharan Africa	3.9
Arab States	5.9
East Asia and Pacific	6.6
South Asia	3.9
Latin America	17.2

Source: Hutton et al. (2006).

Finally, as outlined above, there are specific failures associated with non-state, small-scale supply systems.

In short, solutions to the lack of safe water services in the slums of the developing world lie in the following approaches:

- **Coordinated public sector interventions:** Improving water services depends heavily on upgrading slum conditions more generally. Urban planning and tenure issues require multifaceted interventions within the remit of governments.

That requires thinking outside the “water and sanitation box” (IIED, 2003).

- **The expansion of public network utility:** Long-term policy should be devised in light of the costs and benefits of alternative systems of provision. There are serious doubts about the potential gains of both privatised network utilities (where planning and development challenges persist) and small-scale service providers (because of pricing and quality issues). Ultimately, these concerns can be resolved by investing in the expansion of the public water and sanitation network. ■

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Private Investment in African Infrastructure: Who Bears the Risk?

In industrialised economies, the transfer of risk to the private sector is considered essential if efficiency gains from privatisation of the delivery of basic services are to reach end users.

In SSA, however, the emphasis is on reducing the risks faced by the private sector in order to encourage private investment.

In the energy sector, the contractual terms of the PPA mean that demand risk rests with the government. All the power produced is sold to the state-owned transmission utility and the amount sold is fixed so the private sector has no demand risk.

Rates of access to water and electricity in Sub-Saharan Africa (SSA) remain below those of other developing regions. More than 42 per cent of all Africans—some 300 million people—lack access to an improved water supply and 64 per cent—477 million people—do not have adequate sanitation. Only one in four Africans has access to electricity, and in some countries access rates are as low as 7 per cent.

Infrastructure financing requirements for water and energy in SSA exceed the amounts that donors and governments can provide. Policy-makers are looking to the private sector to reduce the “financing gap” and to bring efficiency to ailing utilities (Bayliss, 2009).

Private sector participation (PSP) in infrastructure peaked in 1997 before tailing off, but is now increasing (Figure 1). Telecommunications attracted most investor interest. On a regional level, just 6 per cent of total private investment went to SSA between 1990 and 2007 (Figure 2) and over 70 per cent of this

was for telecommunications. Less than 1 per cent was for water and sewerage.

Donors and country governments have increased their efforts to attract private investment into infrastructure in SSA. Central to these policies and programmes is the reduction of risk for the private sector.

The generally accepted principle of risk allocation is that risk should lie with the party best able to manage it. While this is fairly straightforward at the two ends of the spectrum—construction risk lies with the private investor, and political risk with the government—there are numerous grey areas in between, such as demand risk, investment risk and the risk of fluctuations in the prices of key inputs, as well as currency devaluation.

In industrialised economies, the transfer of risk to the private sector is considered essential if efficiency gains from privatisation of the delivery of basic services are to reach end users. In SSA, however, the emphasis is on reducing the

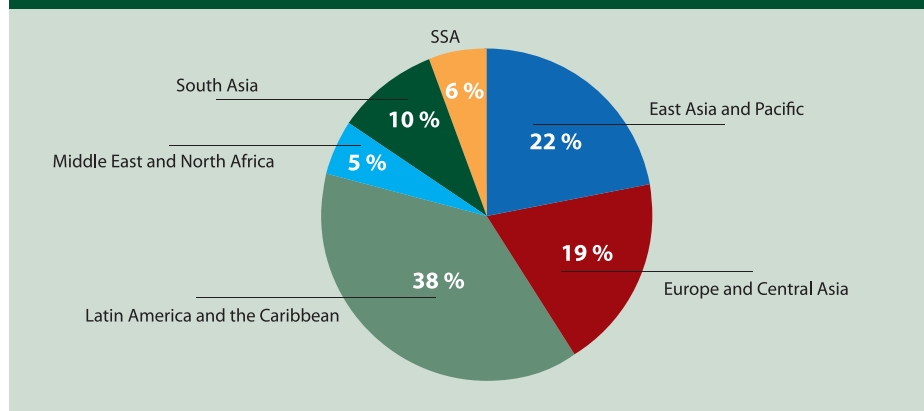
risks faced by the private sector in order to encourage private investment. As a result, the burden of risk has shifted towards governments, taxpayers and end users—not because of their ability to manage it, but because of a focus on the needs of private investors. Using the private sector to provide infrastructure also poses additional risks for the public sector (Bayliss, 2009). Some risk allocation mechanisms are explored below.

Investment Risk

Sector policies are increasingly designed to ensure that governments—rather than private businesses—bear investment risk using sector restructuring and government guarantees. The water sector has been restructured in a number of countries to separate ownership of the assets from the day-to-day running of the service. The state assumes the asset ownership and is responsible for investment in infrastructure, while operations such as billing and revenue collection are offered for privatisation. This approach has been adopted in Senegal, Ghana, Tanzania and Cameroon, and is planned for Angola.

The much-needed finance for infrastructure investment is provided by the government and/or donors; examples are water privatisation in Ghana and Tanzania, electricity in Kenya (Leigland, 2008) and planned electricity privatization in Senegal. This is intended to bring in private sector efficiency while not deterring investors by requiring them to actually commit finance.

Figure 2
Total Private Sector Investment Commitments in Infrastructure by Region 1990-2007



Source: World Bank Private Participation in Infrastructure Database.

The private sector may make recommendations or even decisions regarding investment, but does not have to finance the investment itself.

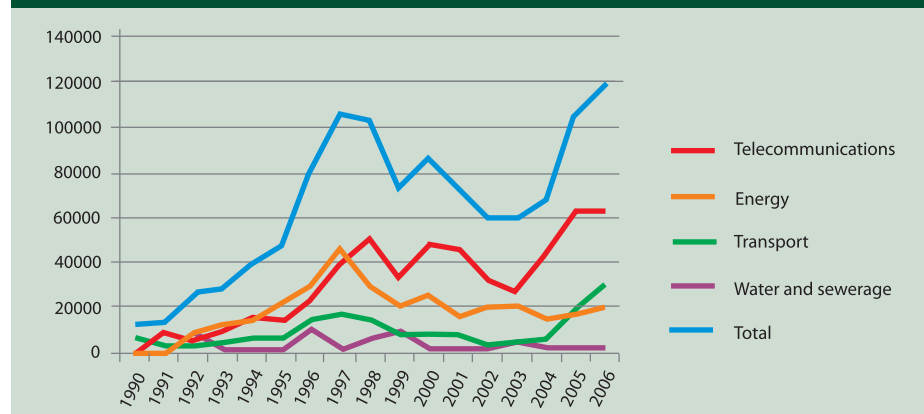
With electricity, PSP has mainly taken the form of stand-alone private generation plants. These are usually underwritten by power purchase agreements (PPAs), whereby the state-owned power company makes a commitment to buy all the power produced at a price fixed in foreign currency. These contract terms are usually fixed for 20 years or more and are underwritten by a sovereign guarantee, thereby protecting the private sector from investment risk.

Demand Risk

Various methods are used to protect investors from demand risk in the water

Sector policies have been reduced to creating an attractive environment for investors, to the detriment of competing priorities such as equitable access. Prices have increased substantially and essential investment in infrastructure has been neglected because attention has focused on privatisation.

Figure 1
Total Private Sector Investment Commitments in Infrastructure by Sector (current US\$ m)



Source: World Bank Private Participation in Infrastructure Database.

sector. These include payment to the contractor based on availability of service rather than demand, and a payment system whereby the government commits to top up fees if they fall below a certain level. Alternatively, remuneration can be in the form of a flat rate that is not based on user fees.

In the energy sector, the contractual terms of the PPA mean that demand risk rests with the government. All the power produced is sold to the state-owned transmission utility and the amount sold is fixed so the private sector has no demand risk.

Where demand falls below expectations, the private sector may seek to increase prices to make up for a decline in the overall revenue position. For example, when drought caused a reduction in power consumption in Uganda because of load-shedding, the private distributor threatened to raise unit prices in order to compensate.

Input Cost and Currency Risk

Investors prefer prices (rather than subsidies) to cover costs, since this reduces their reliance on government payments. Institutionalised tariff-setting practices established in much of SSA allocate cost fluctuations to end users through “automatic tariff adjustment” (ATA).

This means that variations in exogenous costs such as inflation, exchange rates and key inputs like fuel are automatically incorporated into the tariff structure for water and electricity; this happened, for example, in Ghana, Nigeria and Cape Verde. In Uganda, a clear reason for ATA is to provide operating companies with a reasonable profit and to give confidence to current and new investors.

ATA can lead to moral hazard. There is no reason for the private investor to try to lower exposure to currency devaluation, for example, when the cost can be passed on to consumers. The use of ATA pricing methods conflicts with the notion that risks should rest with those best able to manage them.

In SSA, end users are not best able to manage the risk of exchange rate fluctuations and changes in fuel input

costs. They have no control over these costs and cannot diversify away from essential services such as electricity and water unless they increase the use of less safe alternatives. Consumers of utility services in SSA have the least bargaining power. Such an approach is a clear demonstration of the way in which the needs of investors take priority over those of end users.

Additional Risks for Governments

As well as absorbing risks from the private sector, PSP raises further risks for governments. The process of preparing for PSP is costly and demanding. Countries have restructured utilities and drafted new legislation to encourage PSP, spending vast amounts on consultants, yet governments face the risk that there will be little or no interest from the private sector.

In theory, competitive bidding is regarded as essential in order to derive efficiency gains from privatisation. In practice, lack of competition in SSA seems to be overlooked.

In Cameroon, the government spent nearly a decade trying to privatise the water utility before finally managing it in 2007. In Senegal, privatisation of the electricity distribution utility was attempted in 1997 and again in 2001. The government is now trying for a third time.

In Lusaka, plans to privatise the water utility were eventually shelved after several years when it became clear that the risk profile was still too high for investors. In Malawi, the Lilongwe and Blantyre Water Boards were readied for sale in 1996 but privatisation was eventually dropped in 2004.

Sometimes few bids are received. There was only one bid for the privatisation of water in Dar es Salaam.

PSP creates information asymmetries. Regulation relies on information provided by the private firm. Governments face a high risk that firms will not comply with disclosure requirements, and they are in a weak bargaining position when few bids have been received. Investors boost their own profits from PSP in various ways, such as paying themselves

technical assistance fees or using transfer pricing to pay a subsidiary company for services or inputs. This lowers the profitability of the concession but increases the overall revenue of the investor (Leigland, 2008).

Such practices can be complex and might not be disclosed, making it virtually impossible for the regulator to judge what profit is being made. Weak state capacity is presented as a reason for introducing PSP, but weak government skills can undermine the efficiency gains PSP is supposed to bring if private firms are not effectively regulated.

Conclusion

PSP now has such momentum that it is effectively a policy goal in itself. But the efforts that governments make in order to mitigate the risks that the private sector faces also mitigate the supposed gains from the introduction of PSP in infrastructure in SSA.

The private sector brings virtually no investment finance to water. The finance that is leveraged in the electricity sector is at high cost and secured with long-term government guarantees.

Lack of competition and ineffective regulation threaten to counteract the supposed efficiency benefits of PSP. By the time the state has enough capacity to effectively regulate the private sector it could, arguably, provide the service itself.

Furthermore, sector policies have been reduced to creating an attractive environment for investors, to the detriment of competing priorities such as equitable access. Prices have increased substantially and essential investment in infrastructure has been neglected because attention has focused on privatisation. ■

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Affordability and Financing of Urban Sewerage Systems

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The current discussion of sanitation marginalises sewerage, usually on the grounds that it is too expensive for most developing countries. Yet sewerage systems have a massive impact on public health, especially child health. This is a classic example of a public good, and an affordable infrastructure investment for countries in which the great majority of people need a connection.

Urban sewerage was first developed in the ancient cities of the Indus valley around 4000 BC, and is thus a South Asian invention. The first modern system was introduced in London in the nineteenth century, and had four key features:

1. the technology of a network of sewers throughout the city, flushed by water;
2. public administrative structures to finance, build and manage these “expensive works”;
3. a public environmental measure, rather than an attempt to alter individual behaviour;
4. a universal public measure applied to everyone, not selectively targeted (Mackenbach, 2007).

These same principles have been applied in every high-income country in the world. It was very expensive to develop the system and it was financed from taxation or massive cross-subsidies: “public financing of sanitation infrastructure was seen as the only option for ensuring investment adequate to protect public health” (UNDP, 2005, p. 83).

The same principle of cross-subsidy continues to be applied in Europe at a transnational level. The European Union raises taxes in all member states, the equivalent of €20 per person per year, to

support the cost of water and sanitation improvements in the poorer countries.

The need for new urban sewerage is highly concentrated in relatively few countries. Half of all the new sewerage connections needed to meet a target of halving the urban population without a household sewerage connection are in just four countries: India, China, Indonesia and Brazil. Three-quarters of all the connections needed are in just 20 countries.

The next question is how this need can be met, and particularly how it should be financed. The main policy advice of donors and development banks emphasises three key policy positions:

- the insistence on the need to finance developments through cost recovery from users;
- the preference for a central role for the private sector;
- the assumption that sewer systems are too expensive and thus unaffordable.

The UN World Water Development Report (WWDR), for example, states:

“Population growth and burgeoning water demand have convinced most policy-makers that the cost of water system development will increasingly have to be met by users, especially if the Millennium Development Goals (MDGs) are to be achieved ... With private sector participation—ranging from small water vendors to large private utilities—projected to increase in the next decades, the issue of pricing is critical” (UNESCO, 2006, p. 419).

However, the sewerage systems in Europe, the United States and Japan were not developed through full cost recovery from users; they were paid for by distributing the costs among the public, using taxation and cross-subsidy.

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The explicit or implicit position of most of the official donor publications is that, despite the clear balance of benefits, household sewerage connections cannot be afforded.

The idea that the private sector can or will invest significant money in developing sanitation or sewerage systems is also now known to be wrong.

An important step was to move away from private consumer choice to collective public decisions to connect all households: "Connection to a main sewer was compulsory for households, and therefore it was covered by local taxes" (Barraqué, 2007, p. 124).

The idea that the private sector can or will invest significant money in developing sanitation or sewerage systems is also now known to be wrong.

A World Bank research paper, reviewing actual private investment in a 22-year period from 1983 to 2004, concluded bluntly that:

"PPI [private participation in infrastructure] has disappointed—playing a far less significant role in financing infrastructure in cities than was hoped for, and which might be expected given the attention it has received and continues to receive in strategies to mobilize financing for infrastructure ... PPI is inherently limited in scope for financing urban infrastructure for the wide array of non-commercial infrastructure services cities need" (Clarke Annez, 2006).

The explicit or implicit position of most of the official donor publications is that, despite the clear balance of benefits, household sewerage connections cannot be afforded. Measured as a proportion of GDP, however, the capacity of developing economies to manage this form of investment is surprisingly high.

Table 1 uses World Bank/World Health Organization estimates of the annual costs of investments needed to meet the MDGs, with full household water and sewerage connections, for the 20 countries that account for 90 per cent of the need for urban sewerage connection.

For many of the middle-income countries, the cost is less than half of 1 per cent of GDP per year. China, Brazil and India already plan to spend as much on development of water and sanitation as these estimates suggest is needed for the MDGs with the household-connection and urban-sewerage target.

For some lower-income countries, the cost would exceed 1 per cent of GDP per year.

Table 1
Cost of Household Connections for Water and Sewerage as Percentage of GDP

Country	People needing connection to sewers (m.)	% of global total	Annual cost (US\$ m.)	Annual cost as % GDP	Aid needed >1% of GDP (US\$ m.)
China	251	22%	7,878	0.30	-
India	184	16%	5,764	0.64	-
Indonesia	73	6%	2,291	0.73	-
Brazil	60	5%	1,881	0.21	-
Nigeria	43	4%	1,364	1.48	440
Philippines	34	3%	1,069	0.89	-
Pakistan	32	3%	1,000	0.82	-
Bangladesh	27	2%	855	1.22	156
Iran	25	2%	790	0.38	-
Congo DR	15	1%	485	6.29	408
Total in all developing countries	1,141	100%	34,900		2236
Total of top 4 (China, India, Indonesia, Brazil)	568	50%			

Source: PSIRU calculations based on World Bank, JMP (Joint Monitoring Programme of the World Health Organization and the United Nations Children's Fund), UNDESA (United Nations Department of Economic and Social Affairs), and Hutton and Bartram (2008).

If donor aid were concentrated on these cases, the total aid required is about US\$2.2 billion per year, which also seems perfectly affordable.

This level of spending makes greater demands on countries' taxation systems. Establishing sustainable public revenues, and building the capacity of public authorities, are thus more important for developing these services than cost recovery from users or creating opportunities for private investors.

From the other perspective, water and sanitation investments can drive the development of public finance mechanisms, such as municipal bonds, as they did in European and North American countries a century ago.

Donors should stop encouraging countries to try to finance the development of sewerage systems through cost recovery from users, and stop encouraging countries to believe that the private sector will make any significant contribution to investment in sanitation. ■

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Poverty Issues in Infrastructure Regulation: Why, Who and How?

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Infrastructure policy and regulation is fraught with externalities that cannot go unaddressed. One externality that unquestionably intrudes into infrastructure regulation is the provision of regulated products and services to those who cannot afford to bear the full cost of obtaining them. In dealing with the dilemma of making infrastructure available to the poor, some basic issues are unavoidable. They can be characterised as Why, Who and How.

Why?

The basic reasons for supplying such services as electricity, water/sanitation, telecommunications and fuel to the poor are both humanitarian and pragmatic. Those basic services allow the poor to have a better quality of life, be healthier, be better educated and informed, and lead more productive lives. The provision of these services to areas where the poor are concentrated also increases the likelihood of broader economic development that makes possible a long-term and sustainable reduction in poverty.

Enabling poor households to obtain infrastructure services is not simply a matter of humanitarianism. There are often overlooked network benefits for everyone in keeping poor customers on the network. If a cross-subsidy is designed so that tariffs for poor consumers require them to make payments that cover all of the variable costs of serving them, and to make some contribution to the fixed costs of the system, then all other customers benefit by retaining the subsidised customers on the network rather than losing them and having to absorb the fixed costs that otherwise would have been paid by the poor.

In telecommunications, having more people connected enhances the value of network access for everyone. If the poor

lose service because they are unable to pay, the network becomes smaller and its value for all customers is diminished. Enabling the poor to retain electricity, water and other infrastructure service may also have net social benefits in the areas of health, the environment, encouragement of microenterprises and even education. Finally, if affordable access is provided there is less incentive to illegally obtain service and a greater likelihood of producing some revenue rather than none at all. Subsidies to the poor therefore provide real benefits and do not only entail costs.

Who?

Despite the indisputable evidence that regulatory decisions about infrastructure can have significant social effects, there is a vigorous debate about whether regulators are the appropriate authorities to address those issues, or whether such decisions should be left to policy-makers.

Those who contend that regulators should refrain from intruding into externalities such as poverty argue that regulators are given specifically-defined legal powers. The exercise of those powers may well have effects far beyond the regulated sector but, in the view of those who take a narrow view of regulatory powers, that does not justify regulators stepping outside those constraints. Proponents of that view, however, neither deny the effects of regulatory actions nor necessarily believe that those effects should go unaddressed. Rather, advocates of limited regulatory powers contend that addressing the external effects of regulatory policies and decisions should be left to broader policy-makers, such as legislators and/or executive figures.

Legislative and executive decision-makers, it is argued, are more

If the poor lose service because they are unable to pay, the network becomes smaller and its value for all customers is diminished.

The rationale for finding ways to provide infrastructure services to the poor seems compelling for a variety of reasons.

Since doing so will doubtlessly require subsidies, it is critical that the subsidy, if it is to be effective and sustainable, should be efficient, well targeted at the poor, and professionally administered in ways that limit politicisation.

accountable to the public in making what are essentially political decisions. Moreover, political authorities have access to broader resources than those available to regulators (such as the public treasury and taxing powers) to address the external effects. Some maintain that since the resources available to regulators are the revenues collected for regulated services and products, any effort to direct those revenues toward social objectives—such as alleviating poverty—will inevitably distort price signals that will adversely affect the overall efficiency of the sector.

Of course, a countervailing argument is made by those who contend that regulators must be conscious of, and perhaps should specifically address, the external effects of their decisions. There are several arguments for that point of view. The first relates to the fact simply because laws may not explicitly address externalities does not necessarily mean that policy-makers did not intend regulators to address them, but only that they did not or could not have anticipated all of those effects. Moreover, most regulatory statutes require that regulators fully consider the impact of their decisions on consumers.

A second argument is that regulators, being somewhat insulated politically, can address poverty issues in a more targeted, efficient, less politicised and therefore more sustainable manner than politicians.¹ Hence there is a trade-off: on the one hand, regulators may create cross-subsidies in order to address poverty issues, and thereby make pricing less efficient; on the other hand, they are more likely than politicians to make subsidisation more efficient and sustainable. On balance, the trade-off may be worth making. In many cases, political officials, in order to avoid making difficult choices, would simply prefer that regulators assume responsibility for the poor.

How?

Regardless of who decides, there are fundamentally different ways of designing subsidies and cross-subsidies for the poor. Each approach has both beneficial and adverse aspects. They fall broadly into four different structural

approaches: (i) consumption-based; (ii) age-based; (iii) geographically-based; and (iv) income-based.

Consumption-based

The consumption-based approach assumes that, as a general rule, the poor consume less infrastructure service than do more affluent customers. Thus tariffs might be designed so that customers pay less for an initial block of consumption than for consumption above that threshold (for example, \$0.05 per kWh of electricity per month for the first 60 kWh, and \$0.09 per kWh for every kWh consumed beyond 60 kWh). Another variation of the consumption-based approach is to use a two-part tariff (one part reflecting fixed costs and the other reflecting variable costs) and to allocate a greater share of the costs to the variable part of what the customer pays. Since the fixed costs are unavoidable but the variable costs can be avoided by reducing consumption, low-use customers are advantaged. While the latter approach is not ordinarily used specifically to help the poor, those who favour a consumption-based approach have often argued that it serves that purpose.

The benefits of the consumption-based approach are that it is relatively easy to administer, it encourages conservation, it is generally consistent with longstanding tariff practices, and it is easily understood. If pre-paid meters are used, it also has the benefit of being self-enforced. Those benefits, however, may be outweighed by the weaknesses of the approach. The most important weakness is that its basic assumption—that the poor and low-volume users are essentially the same consumers—may very well be wrong. Many low-volume consumers are not necessarily poor, such as the elderly, single-person households and users in vacation homes.

Since eligibility is based on consumption, not income, many relatively affluent customers will gain from tariffs designed to benefit the poor. Additionally, modifying the allocation of costs between fixed and variable costs in order to subsidise the poor better, as opposed to actually reflecting costs, can send significantly distorted price signals

to the consuming public in general. Consumption-based approaches, therefore, while relatively easy to effect, may be highly inefficient.

Age-based

Age based programmes assume either that age and poverty are closely correlated, or that age groups such as the elderly or children merit subsidies as part of a general social welfare programme. Since this article is about poverty, it does not discuss the latter motivation. Such programmes, particularly when focused on retirees, are often politically popular and are therefore appealing to some politicians. The programme design is quite straightforward: either through some methodology or administrative fiat, a discounted tariff is established for all customers who are age-eligible or, perhaps, who have age-eligible persons in the household.

The benefits of an age-based programme are that it is both easy to administer and, absent fraud, is utterly transparent in terms of who benefits. The problem, however, is that many households have elderly and children who are not poor, and who therefore do not need a subsidy for utility service. Hence age-based programmes are not poverty-specific and are therefore highly inefficient. As noted below, it is possible to superimpose an income test on an age-based programme, but that means that a decision has been taken to make service affordable to some poor households but not to others.

Geography-based

Usually, geography-based programmes are based only partly on consideration for the poor. More often than not they are designed to promote rural services such as electrification, or to foster economic development in a particular region. As with age-based programmes, a tariff is set on the basis of some methodology or by administrative fiat, and that tariff provides a discount to customers located in a defined territory. Understandably, such programmes are appealing to local politicians.

The benefits of a geography-based programme are that it is very simple to administer and, like age-based

programmes, is transparent in terms of identifying the beneficiaries. The problem is that most if not all geographic regions have poor and non-poor residents. Thus the subsidy will have many unintended beneficiaries, a circumstance that makes it inefficient and of dubious sustainability. It is also highly subject to politicisation, as has happened in India, where rural subsidies are prevalent and are very difficult to eliminate or even reduce once they are in place.

Income-based

The income-based approach is conceptually simple. Poverty is usually defined in terms of family income, and customers whose income is below a certain threshold are offered services under tariffs designed to maintain service to the poor. Once eligibility is determined, there may be two basic second stages. One is to apply one of the other approaches (consumption, geography, or age) and superimpose an income eligibility test for them so that customers can only qualify for the subsidy if their income qualifies and they meet one of the other criteria.

The alternative second step is to devise a tariff geared to income. An example is a tariff that requires income-eligible customers to pay either a stated percentage of their income or the full bill, whichever is less. Hence the customer never has to pay more than that percentage of income. The percentage can be derived from what a typical household pays for that service.² If the percentage of income is less than the full amount owed, either the balance is forgiven or, if it is not entirely forgiven, at least the service cannot be terminated for non-payment as long as the income-percentage payment is current.

The benefit of an income-based system is that it specifically targets the verifiably poor, and thus the subsidy itself is highly efficient. The effect of the programme is also quite transparent because, absent fraud, it is beneficial only to people who are verifiably poor. Income-based programmes also put the ability to avoid disconnection for non-payment into the hands of the poor, thereby eliminating a convenient excuse governments and

companies often use for failure to enforce payment obligations. The problem is that the system is difficult to administer because it requires documentation of income-eligibility, a process that can be labour-intensive and subject to fraud. This difficulty might be mitigated when there are other government programmes that require income, eligibility and a person's participation in such a programme automatically makes them eligible for an income-based payment system.

As regards income-based payments (as opposed to income-eligibility requirements), economists have argued that the price signals are incorrect since the customer payments are not linked to consumption. Thus, it is argued, income-based programmes provide an incentive for inefficient and wasteful use of energy. For many customers that may be true, but the poor cannot afford to buy as many appliances that use energy or water, and thus it is not clear that price signals carry much significance. Additionally, customers being served on an income-based tariff can be required to take part in energy-efficiency programmes.

Conclusion

The rationale for finding ways to provide infrastructure services to the poor seems compelling for a variety of reasons. Since doing so will doubtlessly require subsidies, it is critical that the subsidy, if it is to be effective and sustainable, should be efficient, well targeted at the poor, and professionally administered in ways that limit politicisation. Given the considerations set out above, it is sensible that regulators be empowered to play a key role in designing and administering the programme, that the programme include elements that focus carefully on providing benefits only to intended beneficiaries, and that it does so on an efficient and sustainable basis. ■

Enabling the poor to retain electricity, water and other infrastructure service may also have net social benefits in the areas of health, the environment, encouragement of microenterprises and even education.

1. There are innumerable examples around the world of well-intentioned politicians who create subsidies for the poor but are unable to resist the entreaties of more affluent customers seeking to be deemed eligible for the subsidised rates. Rural subsidies for electricity in India and natural gas subsidies for the elderly in Philadelphia come to mind.

2. In the US State of Ohio, the first to adopt such a system in 1983, the percentage was 15 per cent of income for gas and electricity combined.

by Alison E. Post,
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The Paradoxical Politics of Water Metering in Argentina

Metering consumption provides strong disincentives against wasteful consumption, reducing total demand and thereby helping utilities maintain adequate pressure levels in outlying districts.

Introducing water metering on a more widespread basis in developing countries promises to have numerous positive effects, especially for poorer city-dwellers living on the urban fringe.

Metering should lower overall demand, thereby allowing utilities to expand services and improve pressure levels in outlying districts with fewer major new investments in system capacity.

Two contrasting yet related scenes can be observed in Argentine cities during hot summer months. In affluent central districts, apartment building superintendents begin the day by washing off the sidewalks in front of their residences, waving hose nozzles from side to side as if water were free. Meanwhile, in outer and often less affluent districts, water pressure falls to such low levels that utilities must ration service; running water may only be available a few hours a day.

Water metering systems can help rectify such unfair allocations of a scarce resource. Metering consumption provides strong disincentives against wasteful consumption, reducing total demand and thereby helping utilities maintain adequate pressure levels in outlying districts.

Reducing total demand, where there is shortage of water, also enables utilities to use existing infrastructure more efficiently, thereby freeing up system capacity for expansion into the urban fringe, where the urban poor tend to live in many developing countries. This is very important, because the construction of facilities such as water and sewerage plants does not tend to be accorded political priority; after all, they are not as visible as bridges or schools and do not deliver concrete benefits to individual constituents. As a result, governments tend to under-invest in such “invisible” infrastructure.

Water metering, along with private sector management and regulation, was advocated by international institutions under the Washington Consensus reform programme of the late 1980s and 1990s. Despite the aforementioned benefits for overall system efficiency and for poorer city residents in particular, efforts to introduce water metering have met keen political resistance in developing

countries. This article examines efforts to introduce water metering by privatised utilities in the Argentine provinces. It highlights the types of political resistance encountered and the strategies identified by utilities and political officials to address household concerns.

Water Metering Provisions in Argentina under Washington Consensus Reforms

In response to pressure from the national government, most of the Argentine provinces chose to “modernise” their water and sanitation systems during the 1990s: 11 provinces granted 30-year management and investment contracts (concession contracts) to private operators, and two others established state-owned private companies that would be monitored by independent regulatory agencies.¹ Contracts and the enabling laws establishing regulatory agencies stipulated very ambitious water metering targets for the new service providers in many cases.

Table 1 shows the eight provincial concessions granted during the 1990s that had stringent targets. Note that these contracts typically required concessionaires to install meters for between 50 and 100 per cent of their residential customer base within the first few years of the contract or face financial penalties.

Problems of Implementation

Between 10 and 15 years after the start of the Argentine concession contracts, as Table 1 indicates, no concessionaire has met its contractual targets. Only two have come close to meeting their goals: Aguas de Corrientes and Servicio de Aguas de Misiones (SAMSA).² Importantly, this lack of progress is observable in concessions that have been widely regarded as successful in terms of extending services to new users, such as Aguas de Salta.

1. The contract for the Buenos Aires metropolitan area was granted by the national government rather than a provincial government. Three other provincial concessions were granted after the 1990s: Catamarca, La Rioja and a contract encompassing one part of Buenos Aires province.

2. As Table 1 indicates, only one of the eight contracts was cancelled: the Azurix contract. The rest remained in place as of January 2009.

3. See the August and September 2004 issues of *El Tribuno*, the provincial newspaper for Salta, Argentina.

4. While tariff hikes of 100 per cent in the province of Tucumán received international attention, more typical in Argentina were increases of 5-20 per cent at any one time.

Table 1
Argentine Concessions from the 1990s with Stringent Water Metering Targets* and Progress toward Water Metering Goals

Concessionaire (Province)	Year of Contract	Contractual Target	Metering rate for residential users circa 1997**	Metering rate in 2003, 2004, 2005, 2006***
Aguas de Corrientes S.A. (Corrientes) ^a	1991	Meters for 100% of customers by 3rd year of the contract.	88% (9/97 - 8/98)	2003: 96% 2004: 92%
Aguas de Formosa S.A. (Formosa) ^b	1995	Meters for 100% of non-residential users within 12 months; meters for 50% of residential users within 2 years.	19% (1997)	2003: 15% 2004: 14% 2005: 14%
Aguas de Santiago S.A. (Santiago del Estero) ^c	1997	Meters for 100% of non-residential users within 2 years; meters for 50% of residential users within 2 years (except in two villages).	0% (11/97 - 8/98)	2003: 0.4%
Aguas Cordobesas S.A. (Córdoba) ^d	1997	Meters for 20% of households by end of year 1, 40% by end of year 2, 100% by end of year 5.	0% (5/97 - 4/98)	2003: 16%
Aguas de Salta S.A. (Salta) ^e	1998	Meters for 10% of households by the end of year 1; by year 2, 30%; by year 3, 50%; by year 4, 70%, by year 5, 90%.	0% (8/98 - 9/98)	2003: 1% 2004: 8%
Obras Sanitarias de Mendoza S.A. (Mendoza) ^f	1998	Meters for 95% of customers by 2005.	0% (11/97 - 10/98)	2003: 5% 2004: 8% 2005: 8% 2006: 9%
Azurix S.A. (Buenos Aires) ^g	1999	Meters for 40% of households by year 5; 70% by year 10, 100% by year 15.	37% (1996)	2003: 40%
Servicio de Aguas de Misiones S.A. (Misiones) ^h	1999	Meters for 90% of users in Posadas by year 3; for 90% in Garupá by year 6.	58% (1997)****	2003: 77%*****

Notes: * Not included: concession contracts for Tucumán, Santa Fe, and the Buenos Aires metropolitan area, which had less stringent metering targets; ** Metering rates calculated from data reported by companies in ENOUSA-COFES (1999); residential users comprised the vast majority of accounts, and consumption by non-residential users was typically metered before privatisation; *** Metering rates reported by companies from the ADERESA benchmarking project, 2003, 2004, 2005, 2006; **** Company (SAMSA) records indicate that the metering rate was only 18.4% at the beginning of the concession. An additional 20% of consumers were billed at metered rates but had non-functioning meters or no meter at all; ***** SAMSA reports that, as of 2008, the company meters 95% of its consumer base.

Source: a.: Pliego de Bases y Condiciones, Capítulo 10; b.: Pliego de Condiciones Particulares, Anexo V, Parte E; c.: Pliego de Bases y Condiciones, Anexo V, Artículo 14.5; d.: Pliego de Bases y Condiciones, Anexo XIII, Artículos 1.14, 1.15; e.: Contrato de Concesión, Artículo 4.2.1; f.: Contrato de Concesión, Anexo II, Capítulo III; g.: Contrato de Concesión, Anexo F, Artículo 2.2; and h.: Contrato de Concesión, Anexo I.

What has stood in the way of implementation? One might suppose that tariff systems did not provide concessionaires with financial incentives to switch consumers from fixed charges to metered consumption. In the Argentine contracts listed above, however, concessionaires could generally charge higher tariffs when consumption was metered and when households consumed above a certain allotment. Rather, the main stumbling block has been consumer resistance. The historically quiescent population of Santiago del Estero province, for instance, took to the streets to march in protest against the installation of water meters, and secured a multi-year delay in the metering programme (Tenti, 2005, p. 165). Meanwhile, in neighbouring Salta province, individuals vandalised newly-installed

water meters, staged major protests in the central city, and voted not to accept metering at neighbourhood assemblies.³

What prompted these strong public reactions against meter installation? Let us start with the obvious explanations. First, metering was introduced at the same time as other controversial measures designed to move utilities to cost-recovery, including scaled tariff increases, the more vigorous enforcement of bill payment, and the “regularisation” of clandestine connections.⁴ Initially, regulatory frameworks for most of the contracts also required households to pay for the cost of meters in instalments. Governments and firms responded to protests sparked by this second issue by shifting the financial burden for meter installation onto the firm or government in most cases.

There were, however, more subtle reasons why consumers rejected metering, reasons that stem from widespread reservations about the motives of public and private institutions in societies plagued by corruption. The fact that different households paid different rates, for instance, aroused scepticism; who was to ensure that meters functioned correctly and bills were being calculated fairly? Technical difficulties only contributed to such doubts. Invisible leaks in household pipes, for example, could lead to extremely high monthly consumption rates. In areas where companies were unable to provide constant levels of water pressure, customers also wondered if they were paying for air rather than water coming through their pipes.

Ways Forward

The difficulties encountered in the Argentine provinces highlight the importance of approaching the introduction of meters in political terms; consumer expectations and scepticism must be anticipated and addressed pre-emptively. Fortunately, one can glean some effective strategies from the Argentine concessions.

- Metered *tariff formulas must be clear* and intelligible to consumers when they read their bills.
- *Rates for modest levels of consumption should be lower than those for higher levels*, and a level of consumption adequate for modest family living should cost no more than the fixed-rate regime.
- Meter installation will meet less resistance if *firms or governments foot the cost of installation*. Users will of course end up funding meters through regular tariffs, presuming the system is not subsidised, but users are unlikely to see this.
- Utilities can *send households bills containing meter readings for several months before metered billing* is

introduced. This gives individuals a sense of whether they should moderate consumption levels before the new rates come into effect.

- Utilities can *schedule meter installation after stabilising water pressure* in given districts, so as to avoid disputes about measurement.
- Finally—and most effectively, according to officials of the Misiones concession—utilities should *proactively identify households with abnormal consumption levels before the introduction of metered billing* and send specialised technicians to investigate if households have serious leaks on their property. According to most contracts, fixing such leaks is a household's responsibility; such proactive efforts by a utility, however, will help neutralise the most likely opponents to metering once it is introduced.

Introducing water metering on a more widespread basis in developing countries promises to have numerous positive effects, especially for poorer city-dwellers living on the urban fringe. Metering should lower overall demand, thereby allowing

utilities to expand services and improve pressure levels in outlying districts with fewer major new investments in system capacity. Recent efforts to implement metering under the Washington Consensus, however, have faced significant political resistance.

Future efforts to introduce metering should be preceded by careful thinking about political strategy, particularly the question of how to address longstanding citizen scepticism about the motives of public and private institutions. The aforementioned strategies identified in the Argentine context may be of use in dealing with consumer resistance in other settings.

■ **Asociación de Entes Reguladores de Agua Potable y Saneamiento de América Latina (ADERASA) (2003, 2004, 2005, 2006). *Ejercicio Anual de Benchmarking*. Processed data.**

ENOHSA-COFES (1999). *La Cobrabilidad de los Servicios Sanitarios en Argentina*. Buenos Aires, ENOHSA-COFES.

Tenti, María Mercedes (2005). *La Reforma del Estado Santiagueña: La Gestión política en los 90'*. Santiago del Estero, Argentina: Ediciones Universidad Católica de Santiago del Estero.

by Degol Hailu, Rafael Osorio
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A “Successful Privatisation” Was Nationalised in Bolivia. Why?

Political discontent and popular mobilisation in Bolivia led to the early termination of the private contracts in 2005.

Since the concessionaire did not comply with the number of new connections stipulated in the contract, the government felt compelled to demand termination of the contract.

Several developing countries corporatised and privatised their water provision on the grounds that the public sector lacked capacity to invest in maintenance and service expansion. The arguments supporting private sector participation in the provision of basic utilities are greater efficiency and a lower burden on public finances.

Privatisation, therefore, is believed to improve access to basic services through large investments in maintenance, network expansion and excellence in

delivery (regularity, more connections, higher quality and so on). Governments would play a regulatory role, setting the expansion targets and controlling tariffs.

There is scepticism, however, about whether profit-oriented concessionaires would really invest in expanding coverage. Concessionaires will not always expand the water grid to poor areas due to lack of market incentives. Private utilities may not find it profitable to supply slum-dwellers, for instance. The high incidence of illegal connections and the low-

Table 1
Piped Water Coverage Rate (%) in Four Bolivian Cities

	1996*			2001			2005**		
	Total	20% poorest	20% richest	Total	20% poorest	20% richest	Total	20% poorest	20% richest
La Paz	87.9	83.4	97.9	88.6	79.2	98.2	96.6	96.2	100
El Alto	76.2	55.6	85.6	69.4	78.1	87.4	87.8	86.0	90.8
Cochabamba	76.5	63.3	84.7	78.6	58.5	93.1	61.8	25.9	74.2
Santa Cruz	95.5	90.2	98.6	95.8	92.2	100	95.6	90.1	100

Source: Authors' calculations based on INE.

* One year before privatisation. ** One year before renationalisation.

income status of households may hinder cost recovery and discourage private investments. Moreover, there is a risk of agency capture, preventing governments from fulfilling their regulatory role.

Ascertaining whether privatisation improves access to utilities is an empirical matter. Bolivia provides an interesting example, having privatised the water utility in two important cities in the last decade. Water provision in La Paz and El Alto was privatised between 1997 and 2005. Private participation was effected through "concession contracts".

An international water consortium won the concession in those two cities. A 30-year contract (1997–2027) was granted for the operation and maintenance of, as well as investments in, water and sewerage provision. The upgraded infrastructure would remain under state ownership after the concession period. In the other two largest Bolivian cities, water provision remained cooperatively managed (Santa Cruz) and under public provision (Cochabamba).¹

Political discontent and popular mobilisation, however, led to the early termination of the contracts in 2005. Why were the private concessions ended prematurely? When the concession contracts were drawn up, the government and the company agreed coverage targets: by 2001, installing 71,752 new water connections—roughly universal access in La Paz and 82 per cent coverage in El Alto. Yet the private provider failed to meet the agreed targets. In addition, upward adjustment of tariffs provoked public outrage. Eventually the unpopularity of cost recovery and the

failure to meet legally binding targets led to the termination of the contract.

In what follows we tell an empirical story. We use data from national household surveys carried out by Bolivia's Instituto Nacional de Estadística (INE) between 1992 and 2005. We analyse access to water in the period before and after privatisation in the cities that privatised water provision and in those that did not. This allows us to determine how far the private provider attempted to push the limits of private provision and in the process how far, paradoxically, the poor benefited. Access to water is considered from three perspectives: delivery (coverage rate), equity (concentration of access) and affordability (water expenditure).

Delivery

The most fundamental indicator for assessing delivery is the water coverage rate—a headcount of households with in-house access to piped water. Access to the utility is closely related to income: connection fees are an entry barrier for the poor, and infrastructure (extended water grids) barely reaches slums or informal settlements. Hence the poorest quintiles of the population usually have more limited access to piped water.

The analysis shows that in-house access to water has expanded more than proportionally in cities with private provision. In Cochabamba, access deteriorated in this period, while in Santa Cruz the coverage rate remained fairly constant (see Table 1). Furthermore, the results point to a positive relationship between having access to water and living in cities where the water utility was privatised.

It is true that the cities had different coverage rates at the start of the period. The higher the initial coverage, the more difficult it might be to expand access further. A performance index² accounts for the effort made by the utility to increase coverage. Taking that into account also, access to in-house piped water still seems to have increased substantially more in La Paz and El Alto with privatisation than in the other cities.

Equity

Equity refers to providing all households with the same level of access to utilities despite their income status. A policy-maker could redistribute wealth either by transferring physical assets from rich to poor households or by increasing provision to the poor more than proportionally. This latter approach seems to be reasonable in the case of utility infrastructure.

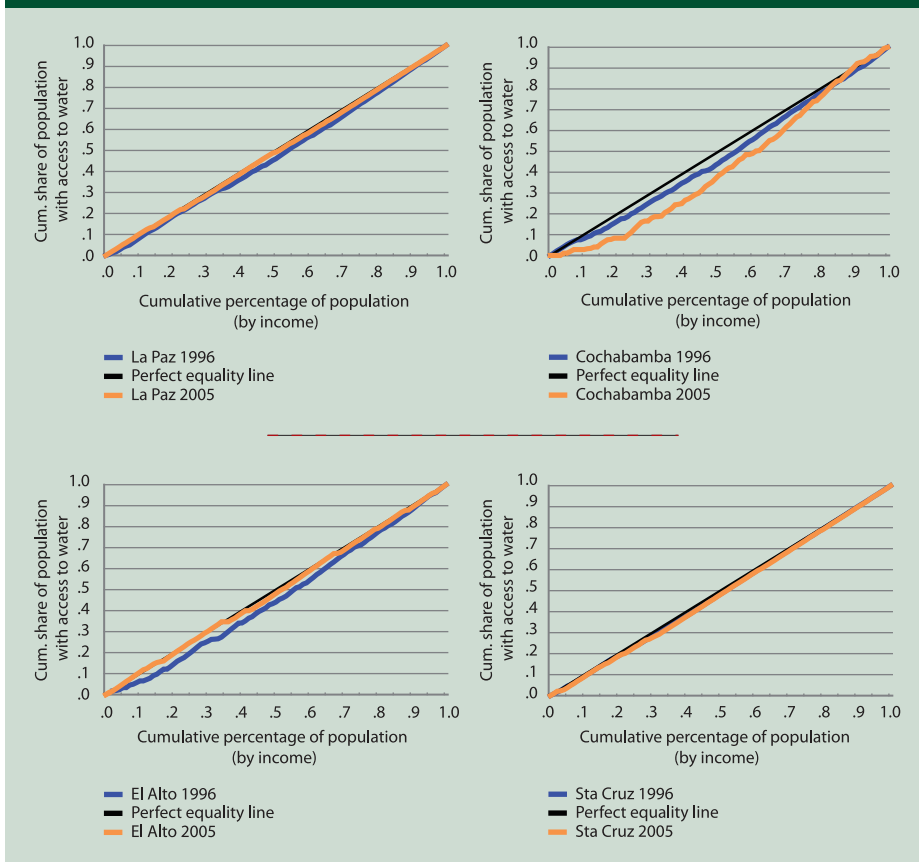
Access to piped water became more equitable (deconcentrated) under the private concessions (see Figure 1). In 2005, the difference in coverage rates between the poorest 20 per cent and the richest 20 per cent of the population fell from 30 to 4 percentage points in El Alto and from 15 to 4 percentage points in La Paz, compared to the period prior to privatisation. A pro-poor increase in access to water is especially noticeable in El Alto. Extending access to the poorest households in particular led to a sharp de-concentration in access to water.

An already high coverage rate in the upper quintiles of the population, however, does not necessarily imply an extension of the water supply to lower-income areas. As mentioned earlier, private investment lacks market incentives to serve areas of low

1. A caveat in the analysis arises from the fact that Cochabamba was privatised for a short period of less than a year in 1999 (see Hailu and Hunt, 2008). For a detailed description of the empirical framework and limitations of the analysis, see Hailu et al. (2009).

2. We calculate a performance index based on Kakwani's achievement function. The index is a non-linear transformation of the original coverage indicator, taking the starting level into account and allowing specification of the appreciation of degree of effort (Kakwani, 1993).

Figure 1
Concentration of Access to Water in Selected Bolivian Cities



Note: The concentration curves show the distribution of access to water in each city. The lowest quintile (the poorer 20% of population in El Alto, who had in 1996 14.6 percent of all water connections, increased its share to 19.5 percent by the end of the concession period. In a perfect equality world, the bottom 20 percent of population should hold 20 percent of the total water access. As the curves move inwards (toward the equality line), a more equal distribution of the access to water is observed.

Source: Prepared by the authors based on household survey data released by INE.

purchasing power. Hence the pro-poor increase in water access in La Paz and El Alto stemmed mainly from enforcement of the targets in the concession contract. The contracts explicitly demanded that the companies provide services to low-income areas and, as stated, the target was to reach very high levels of coverage.

Affordability

Households should not spend more than 3 percent of their income on water bills. This is the acceptable affordability threshold. Although data on household water expenditure is not available for the period immediately before privatisation, we can compare expenditure over 2001 and 2005. Before the concessions in La Paz and El Alto, a 19 per cent upward adjustment in water prices was offered as an inducement to private companies. In 2001, the first revision of targets

(scheduled every five years after the concession) allowed a further 12 per cent increase in water prices.

In a cross-city analysis, as expected, the poorest income quintiles reveal the highest incidence of households that cannot afford water. In 2001, the share of households that spent more than 3 per cent of their income on water bills was as high as 64 and 78 per cent for the poorest quintiles in non-privatised Cochabamba and Santa Cruz, respectively. Throughout the period, moreover, average household water expenditure, by income quintiles, was persistently higher in these cities than in those with privatised provision.

The burden of water expenditure was heaviest for poor households in Santa Cruz, which spent on average 8.8 per

cent of their income on water in 2001, and 5.9 per cent in 2005. The poorest quintile in La Paz and Cochabamba also had a heavy burden, respectively spending an average of 4.7 and 4.6 percent of their income in 2001. In 2005, however, the poorest in La Paz could afford water, spending on average 2.6 per cent of income, while Cochabamba's poorest households still spent above that threshold on water.

Concluding Remarks

From a delivery perspective, the network expanded more in the cities where provision had been privatised than in the others. Of course, we cannot tell whether this would have been the outcome in La Paz and El Alto if there had been no private intervention. Indeed, household income has risen over the years, which would naturally lead to an increase in access to water because of the affordability of connection fees. Nonetheless, an interesting feature of these cities is the large, pro-poor character of water services expansion. The explicit five-year expansion targets imposed by the concession contracts seem to have played a critical role in the high growth of new connections.

Apart from the expansion of access, the price of water services and households' capacity to afford water must also be taken into account. It is usually accepted that households would spend more on water if the utility were private.

That is not necessarily what we have found in a cross-city comparison in the period of privatisation. It is true that, before privatisation, water tariffs are adjusted so as to offer an attractive cost recovery outlook for prospective firms. In this case, households suffer a one-off welfare loss. But quite a large proportion of poor households in the cities where the utility is public or cooperatively managed could not afford water either. Hence affordability seems to be a problem in these cities as well.

The chief message of this analysis is that privatisation contracts not always fare well in poor countries. The concessions in La Paz and El Alto failed. Though the poorest households had better access than before, price

increases created a negative perception among consumers. Spending on infrastructure and service provision reaches the limits of profitability. The company could no longer exploit the ability to pay and engage in cost recovery.

Furthermore, since the concessionaire did not comply with the number of new

connections stipulated in the contract, the government felt compelled to demand termination of the contract.

■
Hailu, Degol and Portia Hunt. (2008). "Utility Provision: Contract Design in the Interest of the Poor", IPC-IPG Policy Research Brief No. 10. International Policy Centre for Inclusive Growth. Brasilia.

Hailu, Degol, Rafael Osorio and Raquel Tsukada (2009). "Privatisation and Renationalisation: What Went Wrong in Bolivia's Water Sector?" IPC-IG Working Paper No. 58. International Policy Centre for Inclusive Growth. Brasilia.

Kakwani, Nanak (1993). "Performance in Living Standards: An International Comparison", Journal of Development Economics 41, pp. 307-336.

Private Sector Participation and Access to Water Supply in Brazil

by Andre Rossi de Oliveira,
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Despite its abundant natural and human resources and its great potential for economic development, Brazil faces many social and economic challenges. There are of course many public policies available, but access to adequate water supply should be part of any initiative to that end. The following statistics, compiled from the National Household Sample Surveys (PNAD) in several years, bear that out:

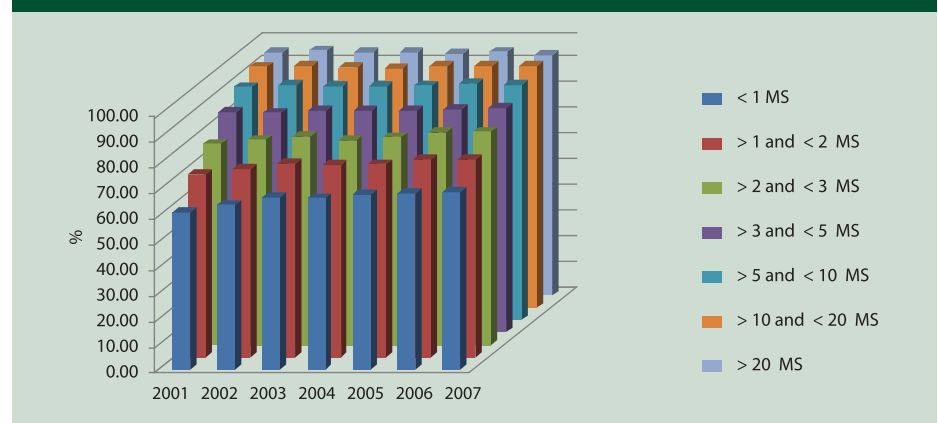
- About a third of households with access to piped water supply in Brazil are in the rich Southeast region, whereas about half of the population without access to water is in the poor Northeast region.
- About 51 per cent of households without access are in rural, isolated urban or non-urbanised areas.
- The illiteracy rate among individuals without access is relatively very high, about 10 percentage points higher than among those with access.
- Individuals without access have appreciably fewer years of study than those with access. A striking 31 per cent of those without access have less than one year of study, and more than 23 per cent have only between one and three years of study.

access are consistent with those usually found in low-income families. Moreover, even though access to water supply has increased significantly in the recent past, its distribution is considerably skewed. Access by households in the lower income brackets is clearly substandard (see Figure 1). Of those that earned less than the minimum salary in 2007, for instance, only 69 per cent had access to piped water supply, whereas 94 per cent of those earning more than 20 times the minimum salary had access.

It stands to reason, then, that further increases in coverage of water supply

Of those that earned less than the minimum salary in 2007, for instance, only 69 per cent had access to piped water supply, whereas 94 per cent of those earning more than 20 times the minimum salary had access.

Figure 1
Brazil - Access to Water Supply by Income Class



Note: MS = minimum salary, which was equivalent to about US\$200 in June 2007.
 Source: National Household Sample Survey (PNAD).

The characteristics associated with households and individuals without

services should mainly benefit poor families. In what follows, we suggest that private sector participation in the water sector has been successful in doing just that, and therefore should be considered a viable alternative to public provision.

To a great extent, water supply services in Brazil still reflect the policies established under the National Sanitation Plan (Planasa) in 1971, which favoured large-scale investments and cross-subsidy schemes. The sector is dominated by regional companies that serve a large number of municipalities and have extensive networks. Since the mid 1990s, however, many municipalities have chosen to outsource the provision of water services to privately owned or operated companies. In urban areas, there were about 1,350 water and sewage entities in 2006, of which 32 had been privatised.

In the North region of Brazil, Manaus, the capital of the state of Amazonas, and Novo Progresso in the state of Pará are the only cities where water is supplied by private companies. In the Middle West there are private enterprises in the states of Mato Grosso, Mato Grosso do Sul and Tocantins. The Southeast has most of the private experiences, mainly in the states of São Paulo and Rio de Janeiro, but also in Espírito Santo and Minas Gerais. In the South, the states of Paraná and Santa Catarina have tried the private provision of sanitation services.

Private ventures undertaken so far differ considerably in terms of financing and tariff structures. In some cases, companies subscribed the totality of their initial capital, while in others relatively sophisticated financing schemes were set up, including equity and debt.

Tariff structures are in line with those adopted in the past by the sector, based on minimum consumption rates and increased block-rate tariffs, and differentiated according to user groups. In some cases, price-cap regulation was implemented. Concessions are the contractual instrument of choice in most cases.

In order to evaluate quantitatively the impact of private provision on access, we first apply panel data

techniques to data from the National Sanitation Information System (SNIS).¹ This includes information on several technical indicators related to water services over the period 1995–2003 for a large number of municipalities.

The control variables in our model are GDP per capita, productivity, investment, and cost variables that try to capture economies of scale and density, besides auxiliary dummies. According to our results, private provision increases access to water supply by more than 26 per cent compared to public provision.

More importantly, the impact of private provision is higher in the lower income deciles, indicating that the benefits of higher access rates due to privatisation accrue mostly to poorer municipalities.

It is safe to say, therefore, that private provision has led to an improvement in access to water services in Brazil, and that this effect was more pronounced in municipalities at the bottom of the income (GDP) per capita spectrum.

These results, however, do not take into account possible “inertia” effects. This means that our results might be spurious if private provision were disproportionately introduced in municipalities that had higher access rates at the outset. To address this issue, we use a different dataset that allows us to compare municipalities before and after the privatisation of water supply services.

The database is from the Brazil Human Development Atlas (HAD), made available by the United Nations Development Programme in Brazil. This database consolidates socioeconomic data available in the 1991 and 2000 Brazilian Demographic Censuses.

We use a difference-in-differences method to compare the change in outcome in the treatment group before and after the treatment (here, privatisation), to the change in outcome in the control group (here, the municipalities that did not privatise their water services).

By comparing changes, it is possible to isolate the effects of treatment from other factors affecting the outcome. As in the previous estimations, this method generates a positive and significant estimated coefficient for private provision, confirming the positive impact of privatisation on the population’s access to water services.

It is safe to say, therefore, that private provision has led to an improvement in access to water services in Brazil, and that this effect was more pronounced in municipalities at the bottom of the income (GDP) per capita spectrum. These results allow us to conjecture that low-income households have benefited the most in that respect, since Brazil has a relatively high coverage rate in water provision (compared to other developing countries) and higher-income families are usually the first to get access.

Part of this result might be attributable to investment obligations assumed by private operators at the time they were granted their concessions. Total scheduled investments by private operators until the end of their concession contracts (between 2025 and 2030) amount to R\$3.38 billion (about US\$1.54 billion), of which R\$1.10 billion (about US\$500 million) or 32.7 per cent had been disbursed by the end of 2004. Disbursements to the end of 2009 are estimated at half the total value of investments.

Additionally, privately owned or managed companies in Brazil generally invest more than public companies or governments,² which may be one of the reasons for the relative success they have had in increasing access rates (see Figures 2–4).

1. Published by the Programme for the Modernisation of the Sanitation Sector (PMSS) of the Brazilian Ministry of Cities.

2. In Brazil, these can be grouped into autarky, direct public administration, and publicly owned or managed companies.

There is evidence that a greater presence of private undertakings in the Brazilian water sector can be beneficial—not only because the sector has a great demand for investments that cannot come entirely from the public sector, but also because private provision can improve access for the poor when under contractual obligations.

This potential greater participation on the part of the private sector would have a wider social impact if it came with strings attached. For instance, it could be made to serve poor customers by placing emphasis on tariff design, so that low-income families were targeted more accurately.

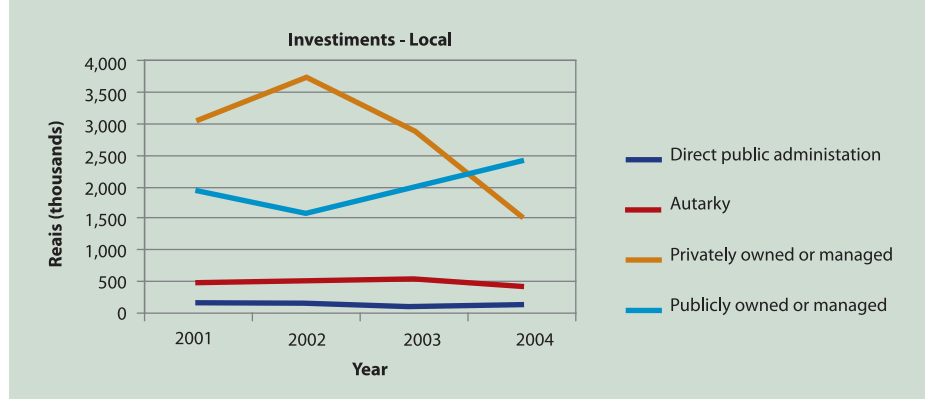
There are cases of private companies, such as Citágua in Cachoeiro de Itapemirim (Espírito Santo state), that actively engage in tariff policies designed for low-income families, usually in cooperation with the municipalities. Citágua has a joint programme with the city that gives waivers to low-income families with up to 10 cubic meters of consumption. Families have to register with the municipal department of social works in order to be eligible.

In summary, the positive outcomes in Brazil are related to contract design, the size and location of municipalities and the sophistication of their staff. Most contracts stressed investment obligations, something relatively easy to monitor. The municipalities are not large in size and are located in relatively prosperous areas. Their staff have also the capacity to enforce contracts.

Political, social and cultural institutions or norms to monitor the private sector should also be fostered. Currently they are almost non-existent. Municipalities and state agencies are the only entities in charge of enforcing concession contracts. Finally, universal service obligations, now absent from most concession contracts, could be negotiated with or even imposed on private providers. ■

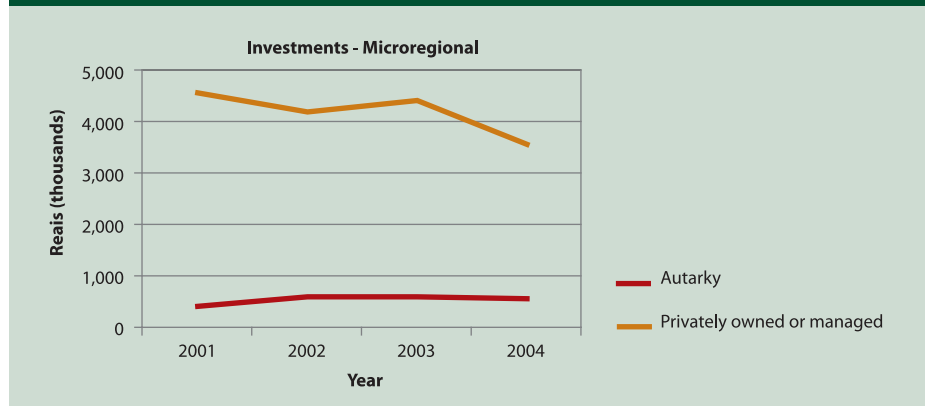
Oliveira, Andre Rossi de (2008). "Social Policy, Regulation and Private Sector Water Supply: The Case of Brazil", in N. Prasad (ed.), *Social Policies and Private Sector Participation in Water Supply: Beyond Regulation*. Houndmills, Palgrave Macmillan, pp. 126–148.

Figure 2
Investment in Water Provision, Local



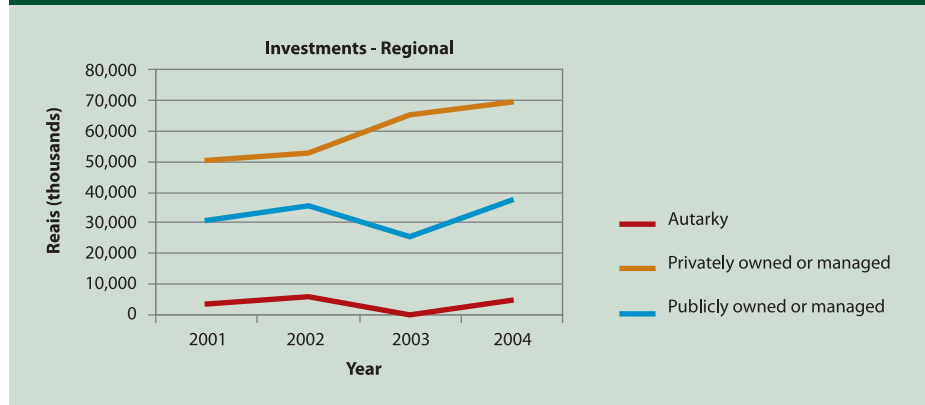
Note: Local operators are those that provide water service only to the municipality where they are located.
Source: PMSS – National Sanitation Information System (SNIS).

Figure 3
Investment in Water Provision, Microregional



Note: Microregional operators are those that provide services to more than one municipality, normally in small numbers and adjacent to each other, including inter-municipal consortia.
Source: PMSS – National Sanitation Information System (SNIS).

Figure 4
Investment in Water Provision, Regional



Note: Regional providers are those that serve several municipalities, including the state water and sanitation companies (CESBs).
Source: PMSS – National Sanitation Information System (SNIS).

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Renewable Energy and Poverty Alleviation in Brazil¹

The Brazilian government has therefore decided to supply electricity to all those living in rural areas.

Brazil's federal government has begun several initiatives to create incentives and obligations for concessionaires to invest in rural electrification, and to supply the service to low-income consumers.

According to the World Bank, some 1.6 billion people in the world, more than a quarter of humanity, have no access to electricity and 2.4 billion people rely on wood, charcoal or dung as their principal source of energy for cooking and heating. Two and a half million women and children die each year from the indoor pollution from cooking fires.

In Brazil, the lowest levels of access to electricity are in the North and Northeast regions. It is no coincidence that these regions have the worst Human Development Indices (HDI) of all Brazilian regions, a fact that reveals a close relationship between living conditions and access to electricity in Brazil.² Additionally, access to electricity is more of a problem in rural areas than in urban areas.

Rural households with the lowest monthly incomes are also those with the lowest rates of electric lighting. The 2000 Brazilian census (IBGE, 2001) shows that 64 per cent of households without such lighting have a monthly family income of less than two minimum wages (one minimum wage in Brazil is equivalent to US\$194). Some 89 per cent of such households have a monthly family income below three minimum wages.

The Brazilian government has therefore decided to supply electricity to all those living in rural areas. That decision stems from the perception that energy is central to reducing poverty and hunger, improving health, increasing literacy and education, and improving the living conditions of women and children.

Programmes for Access to Electricity in Brazil

Brazil's federal government has begun several initiatives to create incentives and obligations for concessionaires to invest in rural electrification, and to supply the service to low-income consumers.

Under the aegis of the MME, the state-owned electricity utility, Eletrobras, launched the Light in the Countryside programme to finance electricity access for 1 million new rural consumers over a three-year period, focusing exclusively on grid extension and contributing to Brazil's national plan for rural development. The Light in the Countryside programme was ended by the federal government in mid 2004, and its goals were incorporated into an initiative called Light for Everyone. Today, the latter is the government's main instrument to provide universal access to electricity.

Table 1 shows the increase in access to electricity in Brazil between 2004 and 2008, and the number of households and population served by the programme. Table 2 gives recent figures for the Amazon region.

It is important to note the higher rate of electricity access in Pará than in Amazonas, since in the latter state the rainforest is a natural barrier to the extension of the electricity grid. In this case decentralised supply (such as through renewable sources) is fundamental to increasing energy access.

In the Amazon region there is also a fund, the Fuel Consumption Account (CCC from its initials in Portuguese), which began in 1993. Diesel oil is subsidised through this fund with resources collected from electricity consumers. The CCC is financed by special taxes on all electricity bills for households in the interlinked system outside the Amazon region.³

Resolution 245/99 of the National Agency for Electrical Energy determined the conditions and timeframes for implementing projects in isolated electricity systems that totally or partially substitute for oil-fired thermolectric

1. This paper is based on the following studies prepared by CentroClima and CENBIO for the Global Network on Energy for Sustainable Development (GNESD): "Energy Access III" (October, 2005) and "Renewable Energy Technologies II Comparison Report" (May, 2007).

2. Inhabitants without access (per cent): Brazil = 5.5; North = 17.6; Northeast = 11.1; Middle West = 3.9; South = 3.1; and Southeast = 1.9 (MME, 2003).

3. The Brazilian Interlinked System (Sistema Interligado Nacional, SIN) comprises companies from the South, Southeast, Middle West, Northeast and North. Only 3.4 per cent of the electricity production capacity of the country is outside the SIN, in small and isolated systems located mainly in the Amazon region. See the Operador Nacional do Sistema Elétrico (ONS) at: <http://www.ons.org.br/conheca_sistema/o_que_e_sin.aspx>.

generation (diesel generators). The scheme will be in effect until May 2013.

Table 3 shows that in 1991, before the introduction of the CCC, 87 per cent of Brazilian households—97 per cent in urban areas and 49 per cent in rural areas—had access to electricity, while the average in the northern region was 92 per cent of households in urban areas and 54 per cent in rural areas. Almost 17 per cent of Brazil's population live in rural areas, but rural output accounts for just 6 per cent of the country's GDP.

In 2002, the rate of access to electricity in isolated systems was still quite low compared to the countrywide figures for Brazil. Moreover, access in urban areas was substantially higher than in the countryside, despite the CCC policy. Nonetheless, the increase in access for isolated communities is evident by comparing the figures for 1991 with those of 2002.

Renewable Technology for Poverty Alleviation in Brazil

While supply structures similar to those in industrialised countries have been established in many urban-industrial agglomerations in developing countries, rural areas in the developing world remained under-supplied. The expansion of grids into remote areas with a low population density soon comes up against its limits: long transmission lines, lower average purchasing power, lower density of connections and smaller loads mean that conventional energy utilities must operate such grid-based supply at a loss. This is the reason for the exceptionally low rate of electrification in many developing countries.

Poor communities in isolated regions are far from the distribution grid and cannot afford fuel supply; often, they use diesel generators to produce electricity. Hence the introduction of renewable energy technologies (RETs) must consider the profile of the community for the purposes of supporting commercial activities. These activities could create local jobs,

Table 1
Annual Expansion of Access to Electricity Under the Light for All Programme

	Families					Total	
	2004	2005	2006	2007	2008	Number of households	Population
North	8,265	41,009	90,067	77,220	99,547	316,108	1,580,540
Northeast	27,157	200,853	271,529	201,141	235,381	936,061	4,680,305
Southeast	24,229	67,342	151,457	59,817	39,413	342,258	1,711,290
South	4,218	36,913	42,896	33,743	33,363	151,333	756,665
Middle West	6,130	31,929	34,064	25,956	33,523	131,602	658,010
Total	69,999	378,046	590,013	397,877	441,427	1,877,362	9,386,810

Source: MME.

improve living conditions and guarantee the operation and maintenance of the RET system.

The Programme for Energy Development in States and Municipalities (PRODEEM), a federal initiative that began in December 1994, was coordinated by the Ministry of Mines and Energy (MME). PRODEEM's goal was to expand access in Brazil's isolated regions that are not currently served

by the conventional electricity grid, mainly using photovoltaic systems and locally available renewable sources, thereby fostering self-sustainable social and economic development.

The most important achievements of this programme are the electrification of schools (Brazil has about 50,000 schools without electricity) and water pumping in areas subject to droughts.

Table 2
Expansion of Access to Electricity under the Light for Everyone Programme, Amazon Region Only

	Amazonas State	Pará State
Number of households (2008)	4,694	68,895
Number of households (accumulated 2004–2008)	23,158	209,044
Number of inhabitants (2008)	23,470	344,475
Number of inhabitants (accumulated 2004–2008)	115,790	1,045,220

Source: MME.

Table 3
Electricity Access in 1991–2002 in Urban and Rural Areas of Brazil and its Northern Region (Isolated systems)

State	Coverage (%)					
	Urban		Rural		Total	
	1991	2002	1991	2002	1991	2002
Acre	95	98.5	13	32.6	70	80.4
Amazonas	96	97.8	16	27.2	79	85.4
Amapá	94	99.3	42	52.0	89	95.6
Pará	91	97.6	37	39.0	71	82.2
Rondônia	90	98.5	20	58.8	68	85.7
Roraima	97	98.9	30	42.4	82	88.6
Region average	92	98.5	54	48.6	75	88.1
Brazil	97	98.8	49	73.2	87	94.8

Source: IBGE (1992) and MME.

At the beginning of 2003 the MME decided to restructure PRODEEM, and in 2005 it was incorporated into an initiative called Light in the Countryside.

In Brazil there are many small and medium-sized communities that are isolated from the urban centres and are not connected to the utility. Hence they depend on fossil fuel for electricity production, particularly in the Amazon region. But several of these places have favourable conditions for the use of renewable energy sources, such as photovoltaic (PV), small hydropower (SHP), biomass and so forth.

Given these conditions and the new rules for universalisation of electricity services, it can be expected that more generation systems will be installed using local energy sources in the not too distant future.

For remote villages, PV, SHP and biomass systems are the best options. Brazil's intense solar radiation favours PV technology and biomass, circumstances that allowed the development of such pilot plants. But PV systems still have high installation costs and are feasible only when other systems are not available. Thus the development of PV solar energy in Brazil is recent and its contribution as an alternative energy source is still tiny.

In these isolated communities, the costs of transporting fuel (diesel oil) to the community make the fuel price double that in urban areas, while bioenergy production costs are lower than for diesel oil. Besides transport costs there are environmental pollution risks during transportation, such as the danger of fuel spillage. Electricity generation from biomass is appropriate in these conditions (Goldemberg and Coelho, 2003).

Biomass is a good option for decentralised electricity generation. The most used forms are agricultural residues, wood residues, vegetable oils and biogas. Vegetable oil pilot plants match the conditions of users, resources, technologies and capacities. But constraints arising from the law regulating the CCC make it hard to secure the benefits of the fund.

In the Amazon region there are projects to test and implement demonstrations units of a conventional diesel engine that has been adapted to operate with palm oil. CENBIO (<http://cenbio.iee.usp.br>) has developed two pilot plants using palm oil in adapted engines in Pará state, with quite significant results.

RETs, in addition to their undisputed ecological advantages, are often the most economical means of supplying energy to remote and thinly populated areas. The typically decentralised renewable energy systems using local energy sources can be easily adapted in size and capacity to meet a modest demand, and thus are especially suitable for overcoming energy poverty in rural areas.

Biomass is a good option for decentralised electricity generation. The most used forms are agricultural residues, wood residues, vegetable oils and biogas.

Renewable energy installations are therefore already contributing to the reduction of greenhouse gas emissions from the energy sector, albeit on a very modest scale. Many long-term projections predict that renewable energy will play a major role in the global energy supply in the second half of the twenty-first century.

Despite these advantages, the dissemination of technologies using renewable energy sources has not yet acquired the desired momentum. Projects to spread renewable energies, particularly in developing countries, must overcome several obstacles:

1. Even RETs that are competitive from a business management viewpoint must surmount the hurdle of the high initial investment costs. Lack of security makes loans hard to obtain, especially in rural areas.
2. In many places, fair competitive conditions have to be established before markets for new RETs can be

developed. Experience in Germany has shown that this goal cannot be met until an appropriate economic policy framework and an environmentally sound regulatory framework have been created, and until specific promotional measures have been implemented.

3. In many regions, RET supply structures are inadequate. Market development is hampered by a shortage of qualified suppliers, rudimentary distribution channels, and inadequate service and maintenance.

Nonetheless, in recent years there have been decisive improvements in the conditions for expanding the use of sustainable energy systems in developing countries. Renewable energy encompasses a number of sources and technologies at different stages of development and maturity.

Generally speaking, many of the technologies have become mature over the last decade; they are no longer curiosities for a dedicated few, but have become big business. Large global companies have entered the markets for wind, solar and biomass technologies, and the traditional finance community is gradually mainstreaming renewable energy into its lending portfolios.

In this context, RET can play a significant role in increasing the energy supply, mainly in remote regions, since adequate policies are being implemented to overcome the barriers discussed here. Such policies should include special incentives to local utilities for RET, including appropriate capacity building for operation and maintenance, as well as economic subsidies. ■

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Privatisation of Utilities in Mali and Senegal: Impact on Poverty

by Luc Savard and Dorothée Boccanfuso, Department of Economics, Université de Sherbrooke; and Antonio Estache, European Centre for Advanced Research in Economics and Statistics, Free University of Brussels

The privatisation of public utilities remains a controversial topic in the policy arena. In many parts of the developing world, privatisations designed to improve efficiency and cost recovery have often been associated with large price increases that have caused enormous social and political tensions (Birdsall and Nellis, 2003). In Africa the infrastructure privatisation process has been more sluggish (Estache, 2005), but slowly emerging evidence on the effects of reforms is hinting at similar problems. Distributional impact analysis applied in Senegal and Mali provides useful information for future reforms.

An inadequate and unreliable electricity supply is one of the most serious constraints on economic growth in many Sub-Saharan African countries. The Millennium Development Goals (MDGs) and the countries' poverty reduction strategies call for increasing electricity coverage by 2015. Reaching this goal and meeting demand will require massive investments, which will have to be accompanied by reforms in the sector.

When a utility is privatised, it might be necessary to raise the price of electricity in order to generate the funds needed to reach the coverage target (capital expenses) set out in the poverty reduction strategy, as well as to cover operating expenses. Raising prices, however, has implications for economic activity in many sectors of the economy and for the welfare of households. In the past, public electricity companies have run deficits and governments have cross-subsidised electricity consumers.

In this article we apply a computable general equilibrium (CGE) model to analyse the impact of pricing reforms in the electricity sector in Senegal and Mali. As suggested by Parker and Kirkpatrick

(2005), privatisation is ideally assessed using CGE models when the goal is to verify the impact of relative price changes on different markets and socioeconomic groups. Macroeconomic assessment is also important because utility reforms typically affect other economic markets such as labour, investments and savings, which can have a significant effect on poverty and on the welfare of the poor. In recent years, these models with micro modules have been used extensively in distributional impact analysis in developing countries. What does the evidence tell us?

Reform in Mali

Mali's public utility operator, Energie du Mali (EDM), was established in 1960, shortly after independence, with capital from the Malian government and the French Development Agency. It offered both water and electricity services.

Initially, EDM operated small diesel-fired generating plants in Bamako and several secondary cities. The cost of producing electricity was very high, which encouraged the Malian government to develop hydro power through the construction of three plants. As a public utility, EDM suffered from the same problems that afflicted other African utilities, including mismanagement and political interference.

In 1986, EDM adopted a performance contract to try to improve operations but the process was disrupted by political instability. In 1994, the government solicited bids to manage the utility. The international competition was won by a French-Canadian consortium including (SAUR, Hydro-Québec and EDF). Each member of the consortium was responsible for functions at EDM. The contract went well for the first year or two, after which relationships between

An inadequate and unreliable electricity supply is one of the most serious constraints on economic growth in many Sub-Saharan African countries.

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the partners and the Malian board of directors deteriorated, and the contract was cancelled in March 1998.

In 2000, the Malian government prepared a 20-year concession contract, which was won by SAUR (the government retained ownership of 40 per cent). Under this contract, the operator would be required to increase coverage from 80,000 to 300,000 electricity customers and, in urban centres, to increase access from 34 to 97 per cent by 2020.

The associated investment needs were about 20 billion CFA francs per year. The contract specified a formula for tariff adjustments until a regulator, created by the same reform, could begin to enforce a price-cap approach. The Ministry of Mines, Energy and Water retained responsibility for the technical supervision of EDM.

Reform in Senegal

During the first attempt to reform the electricity utility, a consortium assumed full management in January 1999. In September 2000, just 18 months after the privatisation, the new government of Senegal bought back the consortium's share of the utility. In the second attempt, the consortium that won the tender refused to complete the deal, leading to another failure.

The pricing practices of Senegal's electricity utility, Senelec, are quite standard. Prices are differentiated by voltage: users of higher voltages are billed the highest price, and the price drops with the voltage. Since March 2002, various pricing schemes have been implemented for specific clients. Tariffs are relatively high by West African standards. Proposed changes in Senelec's prices must also be authorised by an administrative process before taking effect.

With respect to investment, the three-year public investment programmes for 2000/02 and 2002/04 foresaw investments amounting to 8 per cent of the country's total productive investment. The plan confirmed the government's intention to increase the supply of electricity. Other goals of the investment were to increase efficiency in production, improve the institutional framework for

production and distribution, promote regional cooperation, and raise the rate of electrification in rural areas. Despite two failed attempts at privatisation, the government reiterated its will to privatise Senelec. To date, progress towards the chief goal of the proposed reform—to increase the supply of electricity and the share of the population with access to it—has been modest.

Findings of the Distributional Impact Analysis

The impact analysis of electricity price increases and compensating schemes to poor households was performed for the two countries. The first important finding of price increases (ranging from 10 per cent to 45 per cent) is their relatively small distributional impact. The small negative impact is promising since compensating policies are financially feasible and this situation should help implement price increases.

The three main explanations for these results are: the relatively small extent of the electricity network (including household and non-household consumers); the very small portion of poor households connected to the network; and the relatively high prices of electricity before the reforms. This situation is very different from that in many Latin American countries and centrally planned economies in Europe. Original prices were in the ranges of or just below the average tariffs in countries of the Organisation for Economic Cooperation and Development (OECD).

The Millennium Development Goals (MDGs) and the countries' poverty reduction strategies call for increasing electricity coverage by 2015.

Our cost-recovery simulations clearly produce positive effects for the electricity utility in both countries, but negative ones for government, households and firms. The compensatory direct cash

Reforms of the electricity sector should include an aggressive programme to extend the network and increase the access of the poor.

transfer/direct subsidy programme¹ for poor households directly affected by higher power prices—for those connected to the grid—attenuates the negative effect.

However, the negative general equilibrium effect on factor payments (labour, land and capital) overrides the positive general equilibrium effect of the goods and services price decreases; hence other households are negatively affected by those scenarios. It is important to highlight that the cash transfer programme is relatively cheap because so few of the poor are presently connected to the grid.

These findings highlight the importance of taking into account the general equilibrium effect of proposed reforms in order to fully capture their impact on poverty and inequality. Few poor households are connected to the electricity grid. Moreover, few of the poorest households are likely to benefit from early extensions of the network.

Thus it is not surprising that increases in power prices have little direct effect on most poor households, whereas a much larger group will be affected by the general equilibrium effects of the increases. In both countries, however, the biggest losers are the poor households not connected to the power grid, because unconnected households receive no transfers but suffer from the general equilibrium effects of the price increases.

Analyses similar to that presented here can be very useful in policy-making by illuminating the paths by which the effects of reforms are transmitted to the poor. It is also possible to measure the strength of those effects, by providing clues to the design of

effective compensatory policies for groups disproportionately affected by the reforms.

Reforms of the electricity sector should include an aggressive programme to extend the network and increase the access of the poor. Additionally, because the general equilibrium effects on the poor can be clearly negative, it is important to explore alternative targeting policies to compensate the poor—not only for the

direct effects of price increases, but also for negative general equilibrium effects of needed reforms. ■

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Estache, A. (2005). “On Latin America’s Infrastructure Experience: Policy Gaps and the Poor”, in J. Nellis and N. Birdsall (eds.), *Reality Check: The Distributional Impact of Privatization in Developing Countries*.

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Parker D. and C. Kirkpatrick (2005). “Privatisation in Developing Countries: A Review of the Evidence and the Policy Lessons”, *Journal of Development Studies* 41 (4), pp. 513–541.

1. Both types of transfer programme are equivalent in the model, since we assume zero management cost of the cash transfer programme. The direct subsidy programme would consist of maintaining the price of electricity constant for poor households.

Water Supply and Women’s Time Use in Rural Ghana

by Joana Costa, Degol Hailu, Elydia Silva and Raquel Tsukada, International Policy Centre for Inclusive Growth

Women spend several hours a day performing domestic chores and caring for other household members. In developing countries, the burden of domestic activities is intensified by the lack of basic infrastructure, such as access to water and electricity. The time spent on domestic chores is not remunerated and it represents significant forgone income for women. Infrastructure provision, such as access to indoor piped water or community-provided services, potentially reduces women’s time burden. The saving includes time spent on loading, unloading and purifying water, and on walking to and from the water source. Testing for rural women in Ghana, access to water infrastructure (in the community or the household) seems to be significantly related to a decrease in their total working time.

Women’s income poverty in developing countries is usually exacerbated by time poverty. Releasing time constraints would enable women to engage in productive activities (enter the labour market), dedicate more time to other domestic activities (such as childbearing or caring for elderly household members), pursue education or have a little leisure (which may also be used for improving health). Furthermore, access to safe water improves overall household living conditions

through its associated benefits, such as reducing waterborne diseases, lowering infant mortality and preventing the threat of violent aggression towards women on their way to the water sources, which are often located some distance from their homes.

Thus far the literature has, however, not presented much empirical evidence on the relationship between infrastructure and access to labour markets. One example is Ilahi and Grimard (2000), which show that in rural Pakistan, poor infrastructure (water access) reduces the time that women devote to market-oriented activities and increases women’s total work burden.

Other studies only argue that women are more likely to be time-poor than men (e.g., Bardasi and Wodon, 2006, for Guinea). Coulombe and Wodon (2008) found that access to infrastructure does not significantly affect the total amount of hours women work in Ghana, thus suggesting that time saved from domestic work due to infrastructure provision might be used for remunerated activities.

To contribute to this debate and provide some additional empirical evidence we investigate the effect on women’s time use of providing households with basic

Women’s income poverty in developing countries is usually exacerbated by time poverty.

Infrastructure provision, such as access to indoor piped water or community-provided services, potentially reduces women’s time burden.

This article is based on: Costa, J.; D. Hailu; E. Silva and R. Tsukada (2009) “The implication of water and electricity supply in Ghana for the time allocation of women”, *Working Paper* No. 59, International Policy Centre for Inclusive Growth (IPC-IG), Brasilia.

infrastructure. More specifically, we analyse how access to piped water influences women's allocation of time between paid (labour market) and unpaid activities (domestic chores and leisure) in rural Ghana.

The Theory

Studies of time allocation are often based on Becker's (1965) utility model, whereby households combine time and market-purchased goods to produce commodities that comprise their utility functions. A household maximises utility in line with the commodities and leisure time consumed: its problem is deciding on the consumption level and time allocated to each activity (water production, market labour, household activities and leisure). This is constrained by its available income and a daily time endowment.

One or few household members usually fetch water. The household first decides whether the individual will collect water or not, and then decides how many hours will be spent on this activity. Similarly, for the time women spend in the paid market, there is first a decision about entering the job market or not, and then a decision about how many hours to work.

Using data from the Ghana Living Standards Survey, Round Four (1998–1999), we analyse a sample of 2,858 women between 25 and 59 years old living in 190 rural communities. Four models are estimated, with a view to assessing the determinants of women's time allocation in the activities of fetching water, domestic work, market work and total work.

Evidence from the Data

In Ghana there is a clear different pattern of time use among men and women (see Figure 1). We observe both a gender-based division of labour and a heavier time burden on women. Unpaid activities (collecting water and domestic chores) are intensive in women's work time, while paid activities are intensive in men's work time. About 82.8 per cent of men do not fetch water at all, and only 14.5 per cent of them spend between 0 and 5 hours per week fetching water. In contrast, 66 per cent of women

fetch water, and the majority of them spend up to 15 hours a week doing so.

This labour division and specialisation may imply efficiency gains for the household and, therefore, optimal household behaviour. Nevertheless, women as individuals have less control over the household assets (less economic autonomy) and a higher workload.

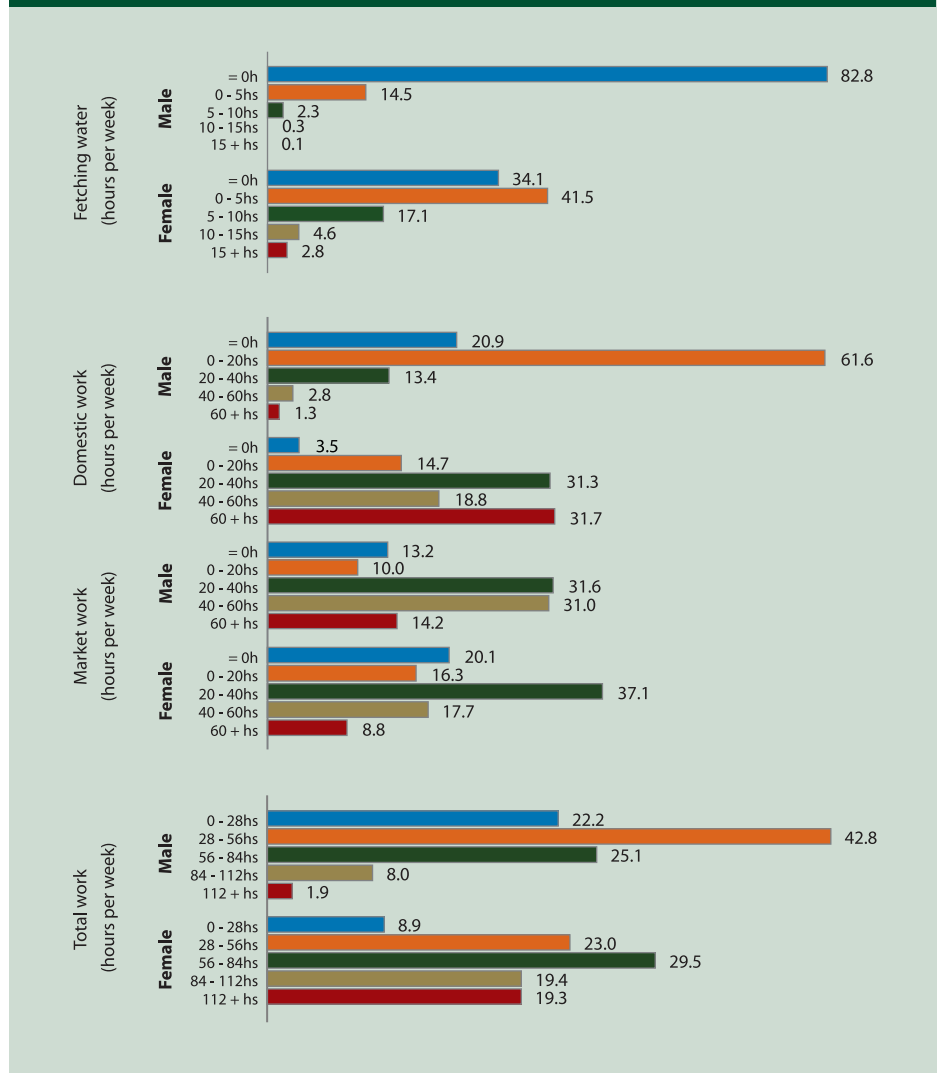
Figure 1 shows that the total work time (domestic plus market work) is much higher for women. For instance, 19.3 per cent of women work more than 112 hours a week, while for men a proportion ten times smaller does the same.

Some 79.1 per cent of men in rural Ghana spend time on domestic work, but 61.6

per cent of men spend less than 20 hours a week doing so. On the other hand, 96.5 per cent of women spend time on domestic work, and 81.8 per cent of total women spend more than 20 hours a week. Interestingly, despite the heavy domestic workload, 80 per cent of women also spend some time on market work, which includes any kind of income-generating activity (even simple home-produced goods).

The data shows that domestic work and fetching water are responsibilities that fall mainly on women. Our next step is to investigate how water provision might determine women's time use. We use econometric models to test the relationship between having water infrastructure and the time women

Figure 1
Men's and Women's Weekly Hours of Work, by Activities



spend on fetching water, domestic work, market activities and total time worked. There may be selection processes involved in deciding whether to collect water or not, as well as whether to enter the labour market or not. A Heckman procedure corrects for this sample selection bias. Almost all women perform domestic work, so there seems to be no selection process for this activity. For this, and for the model of total time worked, we apply ordinary least squares, regressing the time allocated to each activity in a set of control characteristics.

Access to water is defined according to the household's distance from the main source of drinking water. A household has indoor access to water if it is at zero distance from the water source. The community-level infrastructure is measured according to the percentage of households that have piped water as the main source of drinking water. If they amount to more than 50 per cent, then the community has access to water.

Results

Results for the determinants of the time spent fetching water did not present any surprise. As expected, community per capita income has a negative effect on the time spent fetching water. This means that living in a richer neighbourhood increases the probability of having piped water.

If a woman's household has no access to the network, living in a community where more than half of her neighbours are connected to the utility means that there is a lower probability of fetching water from afar (it is likely that other households would resell water from their taps or simply let her fetch it from there). As expected, as the distance to the water source increases, the time spent fetching water also increases, at a decreasing rate.

In the analysis of women's time spent on domestic chores, lower education and having children increases women's time burden. Women living in a community with access to water, however, spend less time on domestic activities. The results are also robust for the distance to the

Table 1
Impact of Infrastructure Provision on Women's Time Allocation

	Domestic work	Market work	Total work
Having community water provision	Decreases	Probability of participation: decreases	Decreases
Shorter community distance from the water source	Decreases	Probability of participation: not significant Working hours: decreases	Decreases

water source: those living closer to the source spend significantly less time on domestic activities.

Determinants of women's time dedicated to labour market presented interesting patterns. Women who are heads of households or spouses of the heads are more likely to enter the labour market, though spouses work fewer hours.

Small children constrain women from engaging in market-oriented activities, while older children have a positive influence on the probability of women carrying out paid work. Living in a community with access to water reduces the probability of women entering the labour market, while living further from the water source does not seem to influence the probability of entering that market. This does imply, however, longer working hours for those women who have already decided to engage in income-oriented activities.

A possible explanation for this result is the presence of a market for water, fostered by long distances to the water source. Greater distances discourage households from engaging in water collection once that activity implies a greater time cost. Households would have the alternative of buying water instead of collecting it, and women would dedicate more time to the activities in which they are already engaged (such as paid work for those in the labour market, or leisure).

In the case of a market for water, if households are to buy it, prices may increase with longer distances to the water source. Higher income is then necessary, so women would

work for longer hours, although the income generated does not represent a rise in household wellbeing.

In summary, when assessing the overall hours worked, water infrastructure seems to be associated with a lesser work burden for women (see Table 1). Women's total working hours are lower in communities provided with water, and lower for those living closer to the water source.

Conclusion

Access to water has a significant impact on women's time use. Poor women from rural Ghana are also time-poor, and the difficulty in accessing water increases the time they spend on both domestic and market activities. Hence, having access to water infrastructure can reduce the time burden that women face.

It is not implicit, however, that the time women save on water collection would be devoted to paid activities. Additional public policies are needed to achieve that goal, especially policies related to educational training and childcare facilities.

■
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by Nitish Jha,
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Barriers to Community-Based Water Supply and Sanitation in India

The questions that bedevil service delivery in India's water supply and sanitation sector is why, despite more than six decades of official efforts to bring these utilities to the poor, access to safe water is still highly inequitable and open defecation remains widespread.

In many communities, disadvantaged groups are excluded from decision-making processes.

In India, there is an urgent need to address the institutional and social obstacles to the provision of water and sanitation. Institutional hurdles, compounded by bureaucratic inertia and the lack of political will to foster greater convergence, create a breach between project planning and implementation. Meanwhile, attitudinal and socioeconomic barriers pose challenges not just to the operation and management of community-based schemes but, in some cases, to their very adoption.

Despite the large investments in water infrastructure for drinking purposes and other domestic uses, India still ranks 133rd among 180 countries for its poor water availability—1,880 cubic metres per person annually. Over 480 million people (or at least 45 per cent of the population) still lack access to adequate safe drinking water (Pangare et al., 2006). Nonetheless, figures on water supply coverage indicate that India is well on its way to covering its entire population of more than 1 billion (see Figure 1).

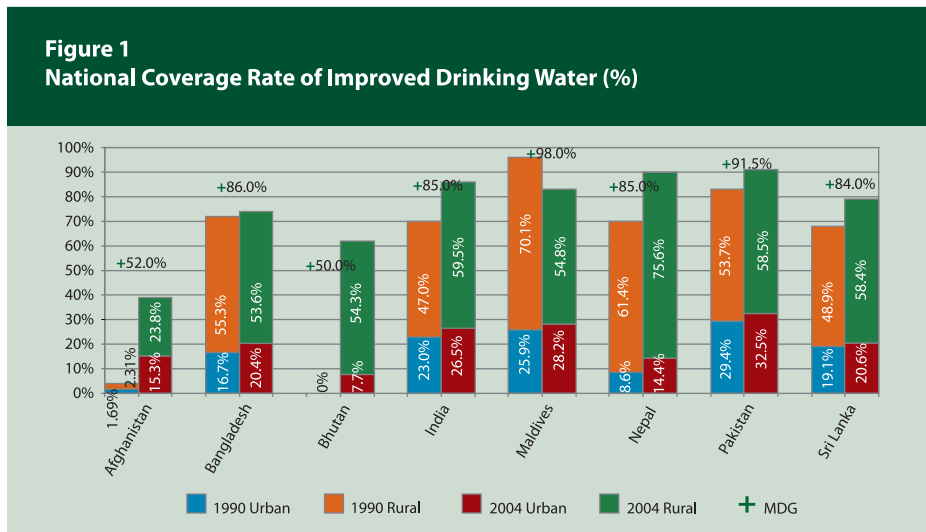
The mid-term assessment report of the Millennium Development Goal (MDG) for water supply and sanitation shows that India has surpassed Target 10 in terms of

nationwide water supply coverage (WHO and UNICEF, 2006). According to that source, 87 per cent of the population was covered in 2004, up from 70 per cent in 1990. Of those covered in 2004, almost 70 per cent lived in rural areas (Figure 1). These national-level statistics seem to be at odds with unofficial sources and, even if true, they conceal wide regional disparities.

According to WHO and UNICEF (2006), sanitation coverage increased from a mere 14 per cent to 33 per cent in the period 1990–2004, and most of the gains were in rural areas (see Figure 2). The estimates seem quite low, but it is possible that the real circumstances are worse because these figures are based on physical infrastructure delivered, rather than on observations of the actual practice of indoor sanitation. Even in terms of nominal sanitation, however, as indicated by standard coverage, India appears to be worse off than some low-income countries.

The questions that bedevil service delivery in India's water supply and sanitation sector is why, despite more than six decades of official efforts to bring these utilities to the poor, access to safe water is still highly inequitable and open defecation remains widespread. Studies reveal that there are problems with the way in which these schemes are planned and delivered by governments, on one hand, and users' receptivity of the schemes, on the other.

On the supply side, the breach between planning and effective implementation in this sector by state agencies is due to various factors, including the lack of institutional convergence; the limited budgets or personnel available for implementation; an emphasis on meeting delivery targets in infrastructural terms rather than on the scheme's long-term management; the absolute discretionary authority and lack of accountability of state agencies; and, not least, limited understanding of the fact that



Source: Prepared using data from WHO and UNICEF (2006, p. 32).

sociocultural factors play a substantial role in determining why schemes succeed or fail (McKenzie and Ray, 2005).

Community-Based Provision: A Recent Institutional Innovation

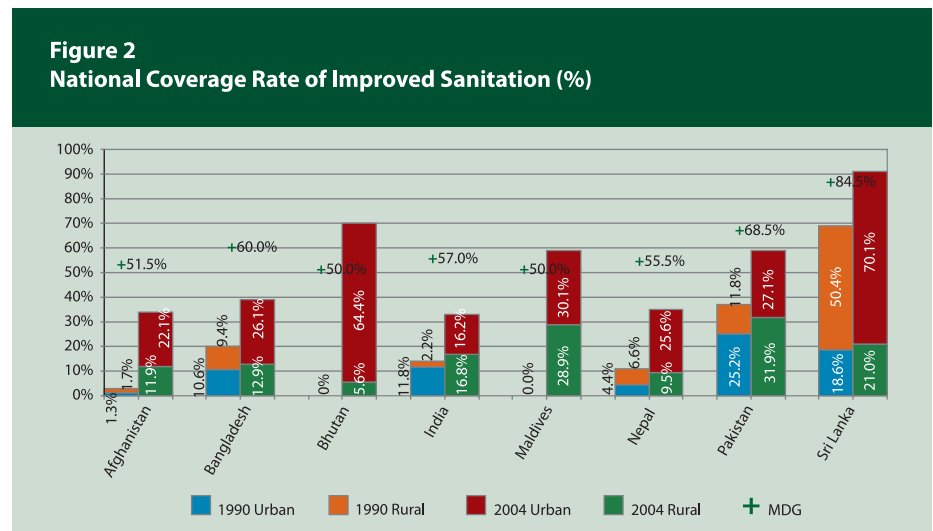
Given these problems and the private sector's negligible presence in this field, a new model is being tried, in keeping with recent thinking in international policy circles about how best to supply these utilities to rural and some poor urban communities. This fresh approach combines water and sanitation delivery, and entails transfer of the management of the drinking water supply and sanitation schemes from state governments to user communities.

The main goal is to have communities participate in the schemes' management, thereby increasing the efficiency and effectiveness of water delivery. There are definite advantages to such an institutional arrangement if the transfer to community management is carried out smoothly. These schemes often fail, however, because mechanisms to foster community ownership are poorly designed and implemented.

Barriers to Community-Based Water Supply Management

It is hoped that community members, led by locally-elected water committees, will be able to run their own schemes with minimal external assistance. However, the chief obstacle to an effective switch to community management of water supply is the prevailing view that water is a right to be provided by the state. In many cases where making water available is problematic, it is hard to convince capable people to play voluntary roles in procuring and supplying water to the larger community for a fee. A related problem is that of using short-term programmes to build much-needed organisational capacity among the user community in managerial, financial and technical terms.

The dynamics of community decision-making also deserve attention. In many communities, disadvantaged groups are excluded from decision-making processes. A scheme's design and implementation should give due consideration to the issue of who performs tasks of system management. Otherwise, it is very likely that the groups with the heaviest burden in water and



Source: Prepared using data from WHO and UNICEF (2006, p. 32).

sanitation management at the household and community levels will be put under further strain, simply because they have no say in decisions that adversely affect their welfare.

Another cornerstone of community management is economic self-reliance, especially in matters of day-to-day operation and maintenance. Despite expressions of willingness to pay during a project's initial stages, the subsequent inability of a critical number of households to pay for services would threaten a scheme's financial sustainability. Hence, if a community has a substantial proportion of poor households that cannot afford even minimal payments, it might be necessary to use a subsidy from external sources or cross-subsidies within the community.

As regards technical management, agencies of the Indian government want communities to retake the lead in water and sanitation management (a role they played before government supply was instituted), but there is no explicit recognition of the fact that the technology for utility delivery has changed considerably. This unfamiliarity poses challenges because of issues such as water treatment, as well as the use, maintenance and repair of non-local and largely invisible (that is, underground) infrastructure (Black and Talbot, 2005).

Barriers to Community-Based Sanitation Management

As with water supply schemes, social, financial and technical factors limit equitable access to sanitary facilities.

In the case of sanitation, however, cultural and attitudinal barriers pose challenges to the very adoption of modern practices, let alone the operation and management of community-based schemes. In many parts of the country, open defecation is a longstanding and socially-sanctioned practice. The implementation of community-based schemes is bound to suffer if the delivery of physical infrastructure is stressed without addressing the attitudes that are not conducive to its proper use.

From a social or religious viewpoint, the non-adoption of indoor sanitation is due to the perception of faeces as being ritually and literally polluting. This attitude is exacerbated by the negative view of toilets being located close to homes because of the smells they generate. Another major obstacle to acceptance of toilets is the need for maintenance. In households, this duty—along with bringing water for personal cleansing post-defecation, as well as the socialisation of children in matters of sanitation and hygiene—usually falls to women.

Communal toilets are more cost-effective than individual household toilets in terms of the money and land they require, but their maintenance problems tend to be more serious. Different castes, religions or ethnic groups in a community have their own social norms, which include restrictions on interactions with others. Such limitations on group members not only include rules about whom they may trade with or marry, but also more mundane matters such as with whom they may eat, bathe or share a toilet.

Failure to take account of such matters often results in communal toilets being built in a sanitary “no man’s land” or in an area where one social group uses the toilet to the exclusion of all others. Because of the consequent lack of well-defined roles and duties, these structures are poorly maintained and ultimately fall into disuse. Conversely, some counterintuitive attitudinal factors result in some village residents preferring open defecation to indoor sanitation. For instance, for relatively wealthy, high-caste women who are otherwise subject to ritual seclusion, communal defecation allows for a degree of social interaction that they would lose if they opted for toilets in or near their homes.

Recommendations

Community schemes complement rather than replace traditional water and sanitation management. A scheme brings with it a new set of tasks to be performed, and thus imposes an additional burden. Certain individuals bear the brunt of this heavier burden of water and sanitation if the new intervention ignores the existing division of labour.

An explicit account of water- and sanitation-related tasks and roles reveals

the extent of the burdens borne at different levels within a community—individuals, households and groups. For example, an examination of the prevailing gender division of labour in the rural water and sanitation sector may highlight the exclusion of women from decision-making in both the household and public realms, despite their responsibility for many of the tasks in this sector. Based on an appraisal of the gender division of labour in any given community, therefore, a concerted effort can be made to ensure that women play a role equal to men in all aspects of decision-making in the sector.

Other fault lines may stem from caste or class. A caste-based analysis may show that one group bears an inordinately heavy burden for sanitation in the community but is simultaneously excluded from drawing water from the village well. This burden will grow if social relations remain unchanged, even as a new scheme is being introduced. In India, projects have been scuttled because local elites have captured resources such as water. Moreover, schemes are often designed to exclude certain groups on the basis of their caste or religion, which may correlate with their weaker political and economic status.

Thus, for community-managed utility provision to be sustainable in the long term, donor and implementing agencies should pay more attention than they have so far to social and attitudinal factors. In the medium term, they should also consider the importance of “handholding” in the capacity building process. Until such time as there is greater parity in decision-making, there should be less emphasis on participatory management *per se* and more on factors such as institutionalising leadership and rules, building skills and creating knowledge. ■

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Utility Privatisation through the Lens of Human Rights

By ratifying one of the key international human rights treaties governments pledge to realise four dimensions of human rights in delivering basic services: their availability, physical and economic accessibility, acceptability and quality.

Efforts to privatise basic services can have serious human rights consequences. While the human rights framework does not “prohibit” privatisation, it must guide the design and implementation of privatisation arrangements.

In the past, the “human rights agenda” and the “development agenda” went separate ways. Development assistance was officially treated as apolitical charity, heavily influenced by geopolitics. The human rights discourse was political and materialised mostly as a gesture to ratify human rights

treaties, such as the Convention on the Rights of the Child in 1989.

There was a tendency for communist countries to highlight economic, social and cultural rights and for capitalist countries to prioritise civil and political rights (hence the adoption of two separate human rights treaties in 1966: the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural Rights, (ICESCR). Much of this only changed after the end of the Cold War.

Privatisation: Impact on Human Rights

By ratifying one of the key international human rights treaties, the ICESCR, governments pledge to realise four dimensions of human rights in delivering basic services: their availability, physical and economic accessibility, acceptability and quality. But reality is often different. For instance, Bolivia's "water war" in Cochabamba attracted significant attention for human rights reasons. The government followed the World Bank's recommendation that no subsidies should be given to ameliorate the increase in water tariffs. Tariffs increased by as much as 200 per cent. For some, this translated into bills that amounted to 20–25 per cent of household monthly income. Privatisation, moreover, did not adequately protect their customary uses of water, such as for agriculture. Widespread protests and civil unrest ensued, which eventually led to the cancellation of the concession. Did the Bolivian government violate its people's economic rights?

The sharp increase in water tariffs made it difficult for many Bolivians to *economically access* (afford) water. Households were cut off from the water supply altogether, so people may not have been able to *physically access* water. By disallowing customary indigenous uses, the arrangement did not ensure that water was supplied in ways that are *culturally acceptable*. Privatisation arrangements can also affect water *quality*, such as when close monitoring by a regulator is lacking.

Signatory states also have three kinds of obligations: to respect, protect and fulfil human rights. While the obligation to *respect* requires that the state *itself* refrain from interfering with the enjoyment of people's human rights, the obligation to *protect* requires a state to prevent *third parties* from interfering with those rights. The obligation to *fulfil* requires states to actively strengthen people's ability to meet their own needs and, if individuals or groups cannot provide for themselves in exceptional cases, to provide the realisation of those human rights.

In the case of the privatisation of basic services, the emphasis of a state's obligation is on *protecting* the human rights of people relative to private actors. The relevant UN committee thus stresses that "where water services [...] are operated or controlled by third parties, States [...] must prevent them from

compromising equal, affordable and physical access to sufficient, safe and acceptable water" (CESCR, 2002, p. 9). Human rights, therefore, provide a yardstick to guide the adequate delivery of services.

Human Rights: Guiding Privatisation

A state's main obligation in privatisation processes is to *protect* people's human rights—in the case of water, for example, by preventing third parties from adversely affecting equal, affordable and physical access to enough safe, acceptable water.

With this in mind, a number of practical steps can be suggested from a human rights perspective to guide the private provision of basic services.

Undertake an impact assessment: Where such assessments have been undertaken on water privatisation projects, they have been able to systematically identify risks, for instance with regard to accessibility and quality of the water supply; examples include the Argentine cases documented by Rights and Democracy (2007).

Consider alternatives through genuine public participation: Governments that have guaranteed the right to water in their constitutions, as South Africa does, are open to involving the private sector but require local governments to first consider public alternatives, including community-managed schemes, social privatisation or internationally-financed schemes (COHRE et al., 2007).

Negotiate loan conditions with lenders: This is often politically difficult, given many countries' dependence on support from donor institutions. The renationalisation of utilities in Bolivia, however, shows clearly that civil society pressure can open up space for governments to (re-)negotiate concession contracts (see the article by Hailu, Osorio and Tsukada in this issue).

Regulate private actors through legislation and the design of service agreements: In their duty to protect, states must regulate third parties to ensure that privatisation does not lead to a decline in access to utilities by the poor. For example, they need to ensure:

- **Economic accessibility:** Poor households should not be disproportionately burdened with water expenses compared to richer households (CESCR, 2002).

- **Physical accessibility:** Marginalised populations such as indigenous people and deprived urban populations should obtain equal access (and also to obviate the danger that providers might "cherry-pick" the most lucrative customers).

Monitor compliance of private actors and ensure access to remedies: The draft guidelines on the right to water presented to the UN Sub-Commission on Human Rights (UN, 2005) call for the establishment or the authorisation of independent institutions such as human rights commissions or regulatory agencies to carry out monitoring activities in a manner that ensures full transparency and accountability. In addition, the guidelines stress that everyone should have access to administrative or judicial procedures in order to complain about acts or omissions in contravention of the right to water and sanitation.

In summary, using a human rights framework as a guide is not only a matter of legal obligation for states that have signed the relevant human rights treaties. It is also vital for setting and raising standards of a life in dignity across countries.

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