Beyond second best: the whys, hows and wherefores of water subsidies

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I. Introduction

The paper will review current thinking and practice on the provision of subsidies to connect to and use water services. Whilst the concentration is on water, the discussions address one of the central challenges of this decade: how can public services be provided effectively within the constraints of the market and with ambitious poverty reduction targets.

The importance of water subsidies in achieving the Millennium Development Goal targets for access to water is widely recognised. This policy may appear to be a reversal of the recent emphasis on cost-recovery for water services. However, as shown below, there have already been examples of where service providers have sought to achieve both objectives. In some circumstances this appears to be possible, but in others it is more difficult. Hence a current issue for providers and regulatory state agencies is how subsidies can be financed, and how they can best be provided. This paper seeks to present the critical issues and experiences to guide further country research with the programme of the Centre. The discussion recognises the current position of many agencies, which is that some subsidies are likely to be necessary if the poorest are to succeed in securing adequate access to water. However, subsidy strategies are varied; different strategies affect important issues such as the short and long-term costs of supply, and who is (and who is not) reached. Moreover, the different strategies have different regulatory implications. The discussion includes a consideration of both formal and informal subsidies. Informal subsidies are, most notably, provided through the ways in which companies, or their employees, do not enforce exclusion regulations on certain types of customer despite illegal tapping or non-payment. Also included are ways in which providers seek to reduce the burden of payment for customers, and hence reduce the need for subsidies.

The paper begins by briefly reviewing current objectives for water service providers and the changing attitudes to subsidies in the recent past. The discussion then moves on (Section III) to consider strategies that have been used to offer and manage subsidies. Section IV considers some of the ways in which such subsidies have been financed with the penultimate Section examine ways of assessing the success or otherwise of subsidy strategies. The final Section concludes.

II. A brief recent history of water service management

It is recognised in the Millennium Development Goals that adequate access to clean water should be increased. Arguably even this goal: "to halve, by 2015, the proportion of people without sustainable access to safe drinking water" is far too modest. The United Nations notes that in 2000, 1.2 billion people (20 per cent of the global population) still lacked access to an improved water source, 40 percent of them in East Asia and Pacific and 25 percent in Sub-Saharan Africa. The percentage of those currently without access to safe water is 40 per cent in the case of sub-Saharan Africa.[1] For the Goal to be met, about 1.5 billion people will have to be provided with access to safe water by 2015. However, a considerable number will remain without adequate services.

In the last decade, the broad context within which water has been supplied has emphasised the importance of cost recovery strategies and responsible financial management policies. As discussed in Mitlin (2004), the previous situation had often resulted in the under-pricing of

[1] See www.developmentgoals.org for the most recent figures.

water and consequently a chronic lack of investment in piped supplies. Outreach has been low and outcomes have been widely regarded as unacceptable. Subsidy systems were often in place but a high proportion of this finance benefited higher-incomes residents because they were connected to the piped network whilst lower-income settlements were excluded. At the same time, the scale of subsidies resulted in the water utilities being unable to extend the services (as they had few external sources of financing and internal revenues were insufficient). As political pressure often prevented the raising of regular water charges, some service providers sought income by charging high connection fees, a strategy that further prevented access by low-income residents (Yepes 1999, 3).

In an attempt to improve the situation, the privatisation of water services has been widely promoted. The hope was that privately managed services would be more transparent and less likely to experience political pressures in the determination of water fees. With higher income, network expansion would be possible. Hence, it has been argued, although unit prices for water may rise, increasing numbers of residents would be able to secure access to piped water services at prices that are considerably lower than the informal services that have been their only alternative. Even where privatisation has not been promoted, water companies have been encouraged to move towards cost-recovery with greater independence from the state and more transparent accounting. Whether supplied by public or private companies, an emphasis on cost recovery and financial management has been combined with measures to encourage supplies to lower-cost consumers. For example, service obligations have been a characteristic of water privatisation strategies during the 1990s (Chisari, Estache and Waddams Price 2001, 1).

Both public or private services providers may face contradictions between commercial and social objectives. Rogers and Hall (2003, 33) emphasise (in a study of water governance) that the key issue is not who provides the supply (public or private), but the quality of the governance structure for water management. It is widely acknowledged that the shift to private sector involvement has increased pressure on water supply companies to balance expenditures and costs and effectively served to increase financial pressures and make transfers more transparent. Chisari, Estache and Waddams Price (2001, 8) go further and suggest that, whatever the intention, privatisation may have reduced the incentive for companies to expand services. They argue that problems arise because companies face high costs in supplying lower-income customers as their unit consumption is relatively low, because they may live in topographically difficult, expensive to reach, sites, and because affordability and therefore demand is low.

Analysed from the consumers' perspective, it is increasingly evident that there are problems with access for some households and affordability remains an issue (Nicol 2000 and Moriarty 2002). Hence neither privatisation nor alternative strategies for cost-recovery can avoid the problem of subsidies. The private sector have increasingly come to recognise that they cannot supply to the poor without some form of subsidy; Hall (2002, 8) quotes JF Talbot (chief executive of SAUR International) who argues that subsidises are a requirement: "…water pays for water is no longer realistic in developing countries: even Europe and US subsidise services… Service users can't pay for the level of investments required, not for social projects…"[2] This is not solely a development issue – problems related to service affordability is also recognised to be relevant for OECD countries (2003, 19):

> …water and sanitation prices are increasing in some OCED countries and are likely to continue to do so. As a result, about half of OECD countries show evidence that affordability of water charges for low-income households is a significant issue or might become one if appropriate measures are not taken.

[2] BiWater (a UK company) withdrew from one water privatisation project in Zimbabwe arguing that, given consumers' capacity to pay, the returns were not sufficient to generate a commercial return Bayliss (2002, 6).

Further interest in the potential contribution of subsidies may come from regulatory agencies. Regulators are commonplace in water services due to the risks associated with monopoly power (related to the operation of piped networks). Whether supply is through a concession granted to a private company or through state management, many governments choose to have a regulator. The function of the regulator is generally to secure efficient pricing. However, governments may be reluctant to countenance price regimes that appear to be unfair (partly because they have a more general objectives for redistribution) and therefore equity issues such as price controls and safety nets are frequently considered to be a part of a regulator's responsibilities (Chisari, Estache and Waddams Price 2001, 2; Rees 1998, 100).

III. Water pricing and subsidies

Whilst the need for subsidies can be recognised, many further issues remain. Water is not a simple private good and there are several reasons why water pricing is a complex process:

- natural monopolies in water supply networks mean that pricing is unlikely to be economically optimum (ie. equal to marginal cost). Commercially determined prices are likely to be higher with monopoly profits earned by companies and lower quantities purchased by consumers;
- inadequate water use is likely to be associated with public health externalities (both in respect of chronic ill health and outbreaks of infectious diseases), therefore the state may wish to encourage a certain level of supply to ensure good health and reduce disease;
- on equity grounds, it may be considered desirable to ensure that all can afford access to something that is clearly a basic need; and
- finally for all such reasons, there may be political involvement in price setting.

Despite the evident political and social interest in water, many recent discussions around water management have been dominated by economists. One consequence is that issues have been characterised by confidence in the formal world. In the privatisation process, it was anticipated that better water management would result in an extended piped supply with many of the poor being able to pay a commercial price for water services. This was based, on willingness to pay surveys and other estimates of market outcomes. Also important was the evidence of payments to informal water vendors.[3] In practice, the emerging picture has not been so simple. Despite predicted and actual past expenditures, families have struggled to pay the cost of connection and service.

What should be charged? As noted above, whilst for some goods the optimum price is relatively unambiguous, this is the not the case for water. Boland and Whittington (2000, 220-2) suggest that water prices (through their tariff structures) have to achieve the following: revenue sufficiency, economic efficiency (largest possible aggregate benefits when water price is equal to marginal cost), equity and fairness, income redistribution, resource conservation; within the following constraints: public acceptability, political acceptability, simplicity and transparency and net revenue stability. Hence, whilst water pricing can be technically analysed and optimised, water pricing is a political issue. Arguments for meeting basic needs and public health issues mean that if the poor cannot afford to purchase sufficient water, there is a strong case for subsidies.[4]

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[3] For example, Foster, Gomez-Lobo and Halpern (2002, 2) argue that water is affordable to the urban poor in Panama because a contingent valuation survey showed they would pay $ 0.46 a cubic metre whilst the price charged by the company is $0.21.

[4] A common standard is 20 litres per person per day (UNCHS 2003, 5). This does not include water needed for water-borne sanitation.

OECD (2003, 38) is broadly critical of past subsidy strategies, arguing that such subsidies have been poorly targeted and have benefited higher-income groups. On average water costs are less than 2 per cent of disposable household income in OECD countries; however, for the lowest income decile in the UK and Mexico, this percentage rises to almost 4 per cent (3.75 and 3.84 respectively) (OECD 2003, 39). Walker, Ordonez, Serrano and Halpern (?, 12) suggest that the WHO has suggested that households should not have to pay more than 3.5 per cent of their income to secure adequate supplies of water and 1.5 per cent for sanitation services. However, it is difficult to interpret the meaning of such percentages if, for example, households do not have enough food to eat. In such circumstances, households are likely to purchase less water than is required for adequate health.

Perhaps the current consensus in respect of subsidies is summed up in the following two quotations. The first quote is part of the response of the Asian Development Bank to the World Panel on Financing of Water Infrastructure and the second is from the OECD. The Asian Development Bank argues that subsidies may be needed, albeit within a framework of cost recovery. The second reflects the changing perception of pricing strategies over the last decade.

> Cost recovery is key to sustaining investments in water that expand access. Costs, however, must relate to the efficient provision of services. Inefficiencies cannot be passed onto consumers. If the extreme poor need to be subsidized, they should be. (Asian Development Bank 2004, 3).
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> [T]here does seem to be a general movement away from the pricing of water services solely to generate revenue, and towards the use of tariffs to achieve a wider range of economic, environmental, and social objectives. Awareness also seems to be growing about which elements of water price structures (connection charges, volumetric and fixed charges, etc.) can best achieve particular policy objectives OECD (2003, 29)

Even with subsidies, adequate supplies of water may be unaffordable for some citizens. The increasing extension of piped supplies, whilst reducing the cost of purchasing adequate supplies, may make access more difficult for the households living in these areas that cannot afford to pay the associated costs. Such neighbourhoods may be less attractive to informal suppliers who may not come, or who may charge more because they have less business. The poorest residents may have to move out of the area to one that is not covered (Chisari, Estache and Waddams Price 2001, 11). However, this example raises a further problem, how can subsidies be targeted to those that need them.

The following sections turn to strategies for, the financing of and the criteria for assessing water subsidies. There are two major issues. The first is who receives the subsidy? Should a subsidy be offered to all through a low price (or free) for the basic units of survival, or should needy households be selected in some way (and how can this be done)? Section III below considers these questions, incorporating a discussion of the informal subsidies and community-managed services. The second issue is how subsidy systems should be financed – either through a cross subsidy with the service or through external monies (general taxation). There are a number of implications of different financing systems for the maintenance of the subsidy and the management of the company. Section IV takes up these issues.

Table 1: Classification of Subsidy Options for Water Services

Categories	Options	Criteria for choosing alternative
Funding	General taxes Cross subsidies	Cost of public funds Maintenance against competing priorities Transparency

Eligibility criteria	Category-based Area-based Means-tested Self-determined or negotiated as informal Community-managed	Equity issues and social objectives Institutional capacities and costs in respect of targeting Incentive and secondary economic effects Administrative costs Stigma issues
Good or service subsidised	Consumption Connection	Relative costs Responsiveness to price changes

Developed from Gomez-Lobo, Andres. 2000. Subsidy policies for the utility industries: a comparison of the Chilean and Colombian water subsidy schemes. Department of Economics, University of Chile

IV. Strategies for water subsidies

This Section reviews strategies to deliver water subsidies. In addition to the conventional discussions of subsidising connections and/or use, and the relative advantages of means-tested rather than area based subsidies, the Section also considers the use of informal subsidies and subsidies within community-managed schemes.

Subsidies for use – increasing (or progressive) block tariffs: Boland and Whittington (2000, 215) suggest that increasing block tariffs (where unit costs rise with the volume consumed) are often considered to be a useful approach. Higher consumption users pay prices that are higher than average costs at the upper levels of their consumption to enable low consumption users to pay prices that are below average costs. Generally speaking, such approaches appear popular. As Box 1 indicates, in South Africa, an estimated 60 per cent of consumers are supplied by providers using such tariffs. In their survey of water utilities in Asia, 20 out of 32 water utilities used such tariffs (Boland and Whittington 2000, 215).

The size and price of the first block clearly very significant in respect of the effectiveness of the subsidy to secure adequate consumption. Boland and Whittington (2000, 218-9) suggest that political pressures may increase the size of the initial block; one Asian Development Bank study of 17 water utilities found that only two had a first block of 4-5 cubic meters (kilo litres) or less a month and most had initial blocks of 15 cubic metres or more a month. Clearly such a policy reduces the effectiveness of this policy in targeting low priced water to those most in need. Equally even block tariffs may still place a considerable burden on the poor. In Cape Town, the city does not charge for up to 6 kilo litres (kL) with subsequent charges being 7-20 kL at R2.60 per kL, 21-40 kL at R4.10 per kL, 41-60 kL at R5.50 kL and finally 61 kL plus at R7.00 per kL. However, (McDonald 2002a, 28) suggests that the end result may still be unfair:

> In Cape Town, for example, which has one of the most progressive tariff structures in the country, a household will pay only R212.40 for consuming 60kL of water per month – an enormous amount of water (used for watering gardens, filling swimming-pools and washing cars)…. Meanwhile, a household in the townships consuming 20kL of water per month would be paying R36.40 – a considerably lower payment in absolute terms but one that is likely to be much higher in proportional terms given typical households incomes in the townships of R500 per month or less.

As exemplified in the case of Cape Town, a particular form of the increasing block tariff is the provision of a fixed amount of free water to ensure that every household has access to the supply required for their basic needs.

A further advantage associated with increasing block tariffs is that higher prices for greater consumption can support environmental goals by encouraging water conservation. High

water consumers are penalised for their use and may cut down on water consumption for luxury activities such as swimming pools or watering gardens. However, in respect of social objectives, it should also be noted that success in lowering consumption will reduce the amount earned through the higher prices, and therefore reduce the amount available for redistribution.

Perhaps the most serious difficulty with this particular strategy is that increasing block tariffs require household connections and the metering of consumption. In many countries this is not possible either because households do not have a supply to their site and/or because of the cost of meters. If the poorest households are without a household supply and are buying from neighbours then increasingly block tariffs may be regressive if their neighbours' supply is charged at the higher rate due to the scale of consumption through that specific water point. Hence in many places, support for water access by the poor through this strategy is not possible. For examples that are indicative of the scale of this problem, in Accra, two-thirds of the poorest 20 per cent of households have no water source in their residence, in Jakarta and Sao Paulo, the equivalent figures are 31 and 19 per cent (UNCHS 2003, 64).

Obligatory service: A further type of subsidy emerges if the regulator requires that all customers who wish to use the service should be supplied at the same tariff. Effectively this is a subsidy from those with low costs of supply to those with higher costs. Chisari, Estache and Waddams Price (2001, 9) argue that this subsidy strategy may be particularly appropriate when some costs of supply are high for specific groups or some groups of customers are difficult to reach.

Adjustments to the tariff price mean that this requirement can be used to drive an inclusion strategy if the price is set low enough. The concerns with this approach are that considerable resources are required for financing and many of those benefiting could afford to pay more. Without additional income, service providers will find themselves without investment finance for network growth. Their failure to expand the network will mean that subsidies are once more, for the most part, enjoyed by those with higher-incomes. Moreover, some of the poorest may still not be able to afford to join the network (due to connection charges or the problems associated with making regular repayments).

Subsidies for whom? If it is decided that, rather than being made available to everyone through lower prices, the subsidy should be made available only to the most needy categories, then there are three possible allocation strategies. Subsidies may be allocated by distinct "needy" category (eg. groups such as pensioners and students where there is a strong correlation with poverty), area-based (depending on spatial concentrations of poverty) and/or means-tested by household. The first is not often used for utility subsidies because it is considered to be insufficiently discriminating (Gomez-Lobo and Contreras 2000, 3). It is widely recognised that there may be high administrative cost and considerable institutional capacity is needed to operate such assessments, particularly those that are means-tested. Yepes (1999, 8) suggests that even in a country like Ecuador the administrative mechanism required is too complex to be feasible. Where the institutional capacity to administer such schemes is in place, then it may be possible. However, further problems include the design of an acceptable and suitable eligibility criteria. For example, a survey of 2,000 households in South Africa found that 78 per cent supported free water and electricity for those earning less than R500 per month but this percentage fell to 52 per cent for those earning less than R1,000 per month (McDonald 2003b, 173). Nevertheless, even those earning between R500-R1,000 may have difficulties in paying for adequate supplies and may be under-consuming water according to public health and basic need criteria. The actual subsidy system in South Africa is described in Box 1.

Box 1: South Africa – Subsidy Systems

In South Africa, there are two available subsidies. First, a capital subsidy is available on a means tested basis. An amount is provided to cover the cost of land, infrastructure and a small housing unit. Generally this provides for a household connection for water and sanitation. Whilst over 1 million subsidies have been provided, there are some disputes over the quality of the construction that has been offered.

There is also a lifeline tariff for water and electricity consumption that was introduced in July 2001; this provides 6 kilolitres of water and 50kWh of electricity each month. This is based on 25 litres per day and an eight-person household (Pape 2002, 184). The issue of service charges in addition to this provision appears to be unresolved. In Durban Metro, residents also benefit from no services charges, 6 kilo litres of free water a month and 50 kw of electricity (Pather 2003). This policy was introduced in some areas in 1997 when Durban Water decided that to provide households with limited quantities of free water each month as it "… was more cost effective to provide the service for free than to recover the costs from households, especially when the subsidy provided to poor households via a national government transfer (Equitable Share) was taken into account" (Palmer Development Group 2000, 26). However, in another area called Dolphin Coast, the policy of free water means that 10kl of monthly consumption is provided but there is a standard monthly charge of R24.60 for those with metered consumption (Hemson and Batidzirai 2002, 72). Some households do not have access to a piped supply to their residence. Those who secure water from standpipes pay R3.94 per kl (with no provision for a lifeline tariff) (Hemson and Batidzirai 2002, 72). Workers, consumers and councillors all agreed these charges were too high (Hemson and Batidzirai 2002, 3).

Once eligible households are identified, a further issue is the scale of subsidy that they should be offered. Foster, Gomez-Lobo and Halpern (2002, 4) argue that such subsidies should only cover part of the cost of water to ensure that there are incentives to use water efficiently and to prevent a habit of non-payment that may be difficult to break. Household subsidies may also need to be capped at some level to prevent other (non-eligible households) using the service. Selling water to neighbours is a common practice in some countries in which connections or access to supplies is limited. Whatever the method used to identify the needy and however limited the subsidy, it may be hard to take subsidies away from a group even if their income levels improve over time. Yepes (1999, 6) argues that the "…experience in many cities including Guyaquil is that the ratio of subsidised consumers and consumption to non-subsidised users and consumption tends to increase over time."

A real and emerging problem for regulators and public agencies alike is what to do with those who cannot afford to pay anything for supplies. The public health issues of inadequate water consumption are considerable (UNCHS 2003, 58-62). On the one hand are those that argue that the poor should contribute something to the costs of water for short-term reasons to ensure that water is not wasted and to address long-term concerns about developing a habit of payment. On the other are those that argue that requiring payment will result in the building up arrears in lowest income households and that subsequent disconnection is not in the public interest and fails to address people's rights and basic needs. However, it must also be recognised that, without supplies direct to each household, it is not possible for subsidies to be targeted accurately even if the institutional capacity for such targeting exists.

Subsidies for what - connection or use?: Water subsidies can either be offered to secure access to the piped network and/or for supplies through the piped network. Some argue that it is better to subsidise access rather than use in part because it is difficult for the lower-income households to accumulate the resources required to pay connection fees. In Argentina, privatisation was associated with the introduction of connection charges of US$ 43-600 for

water (depending on the property area and location) with an additional six-monthly water services charge of US$ 6 plus tax (Loftus and McDonald 2001, 191). Discussions with the regulator in 1994 resulted in a 30 per cent reduction in connection charges but it became evident that costs were still too high to be affordable to many residents (Hardoy and Schusterman 2000, 65). Further difficulties in payment by the poor resulted in the introduction of universal service charge for all customers in place of a service connection change; this is currently US$ 2-3 every two months for those with a water supply and double this for those with a water and sewerage connection (Hardoy and Schusterman 2000, 66).

Chisari, Estache and Waddams Price (2001, 5) add that a further advantage to subsidising connections rather than use is that demand for access is less price-responsive than demand for use, and hence subsidies in this area have less distortion than would otherwise be the case.

Community-managed (cross) subsidies: Community management has grown in popularity (Gross, van Wijk and Mukherjee (2001 26). Such models generally involve community responsibilities in provision and management. In some places, the community may be entitled to a subsidy depending on the policies adopted by the provider and/or the community offer support to those in need. Communities that offer preferential terms to some of their members may be able to avoid some of the difficulties faced by formal agencies in regard to coverage and targeting because the local managers have more information on the situation of the each family and their need for subsidies.

Bigger questions may be raised about the legitimacy of the approach as the areas lend to be very local and hence it depends on the not-quite-so-poor subsidising the very poor. Moreover, the capacity of communities to address these issues differs significantly. A recent survey of WaterAid's work with community management in 150 low-income settlements in Dhaka and Chittagong highlights some of the problems. Whilst some very poor households benefit from the facilities, others cannot afford to participate. Destitute families are dependent on water caretakers or programme committees to allow them to take a couple of pots for drinking and cooking (Hanchett et al. 2003, 43). In some settlements, the preference is for monthly payments that are possible for working families (at Tk 30-35 per month); if families cannot make such a regular commitment, they buy water by container costing four times the amount. Generally speaking, only the better-off families making regular payments are on the community management committees suggesting that there is a general problem with representation and that the rules of the scheme may not address the needs of the poor (Hanchett et al. 2003, 49 and 53).

Minimising the need for subsidies: A further approach seeks to avoid the use of subsidies through strategies such as community involvement (reducing costs) and more flexible payment systems. Various strategies have been tried including the possibility to pay more frequently than monthly, pre-paid meters and micro-credit for connection and improvement costs.

Meters, in addition to enabling quantity-based subsidies, also offer the possibility of flexible payment systems. Solo (1999, 126) and Collignon and Vezina (2000, 21) argue that one of the advantages of the small-scale private operators is their ability to offer flexible payment systems suited to the needs of the poor including daily payments. For households whose livelihood is dependent on the informal sector, it can be difficult to meet fixed monthly bills. One of the advantages of meters is that they can be linked to systems of pre-payment as well as the regular distribution of a fixed free or subsidised amount of water (Marvin, Laurie and Napier 2001, 213). McDonald (2002a, 31) presents a more critical perspective when he argues that meters merely force the poor to cut their own consumption. A cholera outbreak in Kwa-Zulu Natal may have been linked to the difficulties associated with a prepaid meter system as residents (unable to access piped water) used untreated sources (Deedat and Cottle 2002, 88-90). A further compounding factor in Kwa-Zulu Natal was the scale of breakdowns

in the metered system (Deedat and Cottle 2002, 92); and problems with faulty meters have also been noted in a similar scheme in a low-income settlement in Swakopmund, Namibia (personal communication, DRC savings scheme). It is also notable that meters are not the only strategy that can be used to offer more flexible payments. In other cases, such as Cartagena (Colombia), suppliers are considering shifting to a weekly billing system to improve payment levels (Nickson 2001a, 27).

The inability of the poor to pay even a reduced connection charge is a very real issue for the concessionaire in Cartagena (Colombia) (Nickson 2001a, 26). Where cross-subsidies between use and connection are not viable, micro-credit can help individuals and communities and can be used for the initial connection or for subsequent improvements. Chisari, Estache and Waddams Price (2001, 18) refer to El Alto in Bolivia and the offer of loan funds to install bathrooms with a typical cost of US $500 and lending at 14 per cent a year for 5 years. A further strategy is used in Windhoek (Namibia) where households have been working together to lower the costs of connection (Mitlin and Muller 2004). In this case, communities are able to purchase land with standpipes and block toilets, and then upgrade services over a number of years when it is affordable. Whilst a connection charge is still made, this is reduced because households have installed the infrastructure in the residential neighbourhood themselves.

Informal subsidies: There are numerous ways in which "informal" subsidies can be granted. These include the use of illegal connections, failures in billing, irregular checking of meters to prevent tampering, and willingness not to disconnect in case of non-payment. With respect to illegal tapping, there are some indications that it is extensive. The Ghana Water Company estimates that approximately 50 per cent of water produced is unaccounted for due to leakage or illegal connections WaterAid (2002, 6). Menard, Clarke and Zuluaga (2001?, 17) quote one official from the private operator in Guinea who suggests that it is hard to prosecute those who illegally tap the piped network. In South Africa, Ruiters (2002, 53) refers to a market in illegal connections when people have been disconnected due to non-payment of bills but enter into an informal contract with someone to replace the connection. A difficult issue to understand is how much of this is permitted, perhaps because of political or commercial interests, and how much is allowed because there is inadequate monitoring.

A second route for informal subsidies is that of non-payment. In Mexico City, one consequence of high levels of political involvement in water supply decisions was the reduced risk of exclusion through disconnection; "… up to February 2002, once you were connected, you were never disconnected" (Castro and Cruz 2002, 7). In the South African city of Studderheim, Plummer (2000, 26-7) notes that only 28 per cent of low-income households pay their bills. In this particular case, politicians may find it difficult to defend disconnection as the present tariff structures are regressive with higher income households able to pay less than the poor if the latter are connected to the public network but consume more than 7 kilo litres a month (Plummer 2000, 26-7).

Greater emphasis on cost-recovery has sought to reduce non-payment; however, the success is not clear. In some privatisation schemes problems with affordability together with the objective to increase access have resulted in a number of initiatives with local grassroots organizations in addition to the promotion of single household connections. Whilst generally there is very little information on non- or late repayment as a result of privatisation, some data has been reported for such schemes. Nickson (2001a, 25) notes that in community-managed schemes established by the private sector company to reach low-income settlements in Cordoba (Argentina), only one in ten of the regions had collected more than 50 per cent of the water bill. Hence there is evidence to show that water management problems are continuing in part due to the difficulties associated with affordability. This is reinforced by a view from Mexico City; Castro and Cruz (2002, 14) suggest that metering, recently introduced to increase incentives to pay, may be a flawed process with people of all incomes finding ways

to falsify readings. Problems related to the possibility of meter tampering have also been noted elsewhere (Walker, Ordonez, Serrano and Halpern ?, 4).

Even extensive subsidies cannot guarantee that all will receive water who need it. Despite the "lifeline" free minimal water provision introduced in South Africa in July 2001, in the last quarter of 2001, a reported 133,456 households had their water cut off due to non-payment of bills (Pape 2002, 184). In this context, there is considerable pressure to secure access to water by informal means.

Box 2: South Africa – repayment issues

A recent study considers a number of aspects of pricing and cost recovery of water services in over 300 municipalities throughout South Africa. In summary, just over 60 per cent of consumer bills are fully paid with about 80 per cent of consumers are on meters. More than 70 per cent of consumers live in municipalities where they have a restricted service if they are less than 90 days in arrears, and more than 60 per cent of consumers are subject to progressive tariffs. The evidence suggests that measures to encourage repayment such as progressive tariffs, promises of additional services to high payment areas and opportunities to pay for services at supermarkets can increase repayment by on average 7.5 per cent. Predictions of the implications of extending services on repayment suggest that payment rates will fall because these people are generally poor, some will be offered public taps and administration costs increase to service non-payers. To some extent, the policy of free basic water reflects this reality. The author argues that the opportunity costs associated with this policy are much lower than otherwise because cost recovery policies have had limited success.
Source: *Alence 2002*

IV. Financing subsidies

There are two possible approaches to distribute direct subsidies. First, they can be allocated directly to consumers as a financial transfer and secondly they can be sent to the company for allocation to those in need through reduced prices with some form of targeting. The first requires a benefit system and moreover runs the risk that consumers will purchase less water than is socially desirable. Public health concerns suggest that water subsidies should concentrate on the second option.

Foster, Gomez-Lobo and Halpern (2002, 1) argue in favour of external financial support (rather than cross-subsidies) as they are "…transparent and explicit, and minimise distortions in the behavior of water utilities and their customers." However, whilst the general tax system may be theoretically the most efficient way to raise the finance for water subsidies, this is not necessarily the case for countries with an underdeveloped tax system (Gomez-Lobo and Contreras 2000, 6). OECD (2003, 37) notes that historically water infrastructure has been financed through the taxation systems. However, even in OECD countries, multiple pressures on state budgets means that such finance is becoming more difficult to secure and there is interest in cross subsidy systems. It is also possible to use a hybrid or mixed system and Gomez-Lobo and Contreras (2000) discuss the example of Colombia where cross subsidies are the first method of financing but this cost is capped to a maximum of 20 per cent of the bill of higher-income households, industrial and commercial customers. If the total cost of subsidies exceeds this amount, then additional funds are forthcoming from national and provincial government budgets.

In a context in which public resources are scarce, the water sector itself may need to generate the financial resources needed to expand access (Asian Development Bank 2004, 3). In the case of water, cross subsidies might be between customers (related to need and affordability with richer subsidising poorer households) or between access and use (with the capital costs

of connection being reduced and these costs passed onto regular payments).[5] Cross subsidies offer the advantage of pro-poor pricing strategies and/or the extension of piped water supplies together with full cost recovery. In general, cross subsidy strategies seem popular. Chisari, Estache and Waddams Price (2001, 17) discuss the example of El Alto in Bolivia where connection charges were reduced to US $155 for water and US $188 for sewage with the subsidy being recovered from the service charge.

If subsidies are to be offered to lower-income income groups with the entire service covering aggregate costs, then service areas need to be established with consideration being given to the establishment of supply areas that include richer consumers, who are able to pay higher prices and generate the surplus needed. The current situation in South Africa exemplifies some of the possibilities and their relation to markets. In South Africa, there is a central subsidy for local authorities to provide a basic allowance of free water (Palmer Development Group 2000). In Durban, the scheme appears to work relatively well but, in this case, the ability to use a cross-subsidy within the city is critical to the scheme (personal communication, Director of Infrastructure, Durban Water). As recently evidenced, in other towns in which there is insufficient income to finance such a subsidy, suppliers and users face major problems in ensuring that water is affordable (McDonald and Pape 2002).

The problems of raising sufficient revenue have been raised by Walker, Ordonez, Serrano and Halpern (?, 7) who suggest that consumption levels between rich and poor do not vary that much. Yepes (1999, 4) notes that higher-income consumers may be so price sensitive that cross-subsidies may not result in sufficient income because their unit consumption falls as price rises. However, in practice it appears that water providers do manage to raise some income through such strategies. As subsidies result in prices not being equal to marginal costs, they will have a cost associated with them. Consumers who pay higher prices may reduce their consumption; others who pay low prices (or nothing) may waste water (see the example from Durban in the following section). Yepes (1999, 4) suggests that prices may be so low that companies do not collect the monies owing. A further problem is that the larger scale consumers such as commercial companies may be able to find alternative sources of water (private vendors and private boreholes) if prices to this group are too high.

There are also numerous examples of urban development programmes in low-income settlements that have sought to assist communities to access water, particularly to install infrastructure such as piped water supplies. A very typical arrangement would be for the community to provide unskilled labour free of charge thereby reducing the charge made for installation. In some cases, communities would repay additional cost of materials if no other subsidies were available. In the case of the Community Organization Development Institute in Thailand, loan funding is available for member communities. Groups have to be active savers for several months prior to accessing loans. In other cases, the government would provide the required materials free of charge.

V. Subsidies – frameworks for assessment

[5] Cross subsidies within water provision arise for many reasons other than equity and public interest issues. Chisari, Estache and Waddams Price (2001, 4) suggest that "Cross subsidies ie. prices which are not determined by the pattern of (marginal) costs may arise from the market itself or may be imposed by the regulator." Such subsidies arise because a single tariff is used regardless of the costs of supply. Hence although different areas may be associated with different costs of supply, prices may not be adjusted either because there is not sufficient information to accurately identify differential costs or because it is agreed (or required by the regulator) that an equal price should be used for reasons such as equity.

Drawing on Gomez-Lobo and Contreras (2000, 4) and Lovei et al (2000) (quoted in Chisari, Estache and Waddams Price(2001, 6), the following assessment framework for subsidy systems and strategies can be developed:

- Coverage: who is included and how many are included who are not in need of support (errors of inclusion)
- Targeting: who is entitled but does not benefit (errors of exclusion)
- Predictability: of water bills for households and industry
- Minimising distortions due to price changes (for example, if water is wasted because there is no charge)
- Minimising fiscal costs
- Minimising administrative costs

Coverage measures how many of those offered subsidies do not fulfil the criteria for need. Walker, Ordonez, Serrano and Halpern (?, 9) find that in central America rich groups may be benefiting as much as poor from water subsidies. A low basic tariff for the first units of consumption offers a low price to all and hence runs the risk of such problems. However, such strategies may be preferred where the costs of targeting are very high. More complex systems of targeting system need to be sensitive to the fact that as they are not universal, and that therefore there may be "errors of exclusion" with those entitled to benefit not being reached and hence the public and private benefits sought by the subsidy not being realised. Herrera and Roubaud (2004, 14) point out that there are considerable movements into and out of urban poverty. With this knowledge, we can recognise that even targeting that is well conceived may have a high failure rate when assessed over several periods of time. Box 3 below summarises some research in Chile and Colombia that considers these aspects in some detail.

Box 3: Assessing coverage and targeting: Chile and Colombia

Gomez-Lobo and Contreras (2000) compare the Chilean (means-tested) and the Colombian (area-based) subsidy systems and assess them in regard to errors of inclusion and exclusion. In the case of Chile, a major concern is that it appears that only half (or less than half) of those entitled to receive the subsidy in the poorest groups actually receive the subsidy. At the same time, some households in higher income groups manage to secure the subsidy (for example, 7 per cent in the 5th and 6th income deciles). The high rate of targeting failure reflects the smallness of the group entitled to subsidies (perhaps 5-10 per cent of residents) and the reliance on a voluntary request for the subsidy. The errors of exclusion are over 50 per cent even under the most optimistic assumptions.

Turning to Colombia, the poor correlation between residency and income means that there are high errors of inclusion associated with this area-based subsidy system. This also reflects the relatively generous system in which the first three groups within a six-fold residential classification are entitled to receive a subsidy. In the highest-income decile, fewer than 40 per cent of households live in socio-economic areas 5 and 6 in which they pay a surcharge to subsidise the consumption of poorer households. There are also considerable errors of exclusion; if the subsidies are targeted on those living in the poorest area (social economic segment 1) then over 80 per cent of the target group are excluded (assuming this is deciles 1-3). Even if the next social economic area is also included, about one-third of the target group remains outside the scheme.

Both schemes suffer due to the ineffectiveness of subsidy strategies. Assessing the efficiency of both programmes suggests that the Colombian programme has the better overall performance and this appears to be due to better targeting properties (whilst there are higher errors of inclusion, fewer targeted households are excluded).
Source: Gomez-Lobo and Contreras (2000)

There are concerns that price changes related to subsidies cause changes in behaviour and thereby incur other costs. As suggested above, one example is the concern that free water will encourage waste. Palmer Development Group (2000, 26) describe the changes in water supply systems in one low-income settlement when Durban Water decided in 1997 to provide households with 6 kilolitres of free water each month. Whilst there were many positive comments from members of the community, there were also concerns. Some community members felt that now water was free, the resource was wasted and pipes that were broken were not mended. Durban Water told the community that mending pipes was their own responsibility but it appeared that the structures were not in place to manage this issue (Palmer Development Group 2000, 28). In the examination of subsidies in Chile (discussed in Box 3), Gomez-Lobo and Contreras (2000) also note their analysis suggests that the subsidy reduces the likelihood of job search among lower-income families benefiting from the subsidy (poverty trap), although these effects are very small. In the case of Colombia and the area-based subsidies, there is relatively little evidence to suggest that house prices have increased in response to the subsidy.

Administrative costs are potentially a significant burden for any subsidy regime. Gomez-Lobo (2001) exemplifies these problems in a study of the Chilean system. Each year, the Ministry of Planning determines how many subsidies are to be granted and how they are to be applied; the criterion for assessment is that "…no household should pay more than 5 per cent of its monthly income in water and sewerage charges" Gomez-Lobo (2001).[6] The entitlement of the family has to renewed every three years and even households that receive the maximum subsidy have to pay a minimum of 15 per cent with subsidised consumption being limited to 15 cubic metres a month. The administrative costs are considerable as the scheme is dependent on household water being metered and household means-testing (Gomez-Lobo 2001). In this case, administrative costs are reduced as a single means-testing process is used to determine entitlement for a number of state benefits.

VI. Conclusions

"It is important that there is recognition that basic services – who gets what, who doesn't and why – is essentially an issue of political economy" Calaguas (2000, 9).

Regulation, policy and politics are critical to determining access, affordability and adequacy in relation to water services. Prices in the water industry are essentially managed prices that are partly related to costs (which are themselves subject to regulation) and related cost recovery objectives. As noted here, they may also be determined by social and/or environmental objectives.

There is an increased recognition of the importance of subsidies in ensuring the poorest can access adequate supplies of water. However, it is still not clear how subsidies can be most effectively targeted to achieve and better the Millennium Development Goal. Given the considerable diversity in the world, there is a need to consider what are the optimum subsidy options under a range of circumstances. How can the poor be targeted with or without piped services to the household? How can water subsidies take into account the particular characteristics of water including its essential contribution to human life and the scarcity associated with a natural resource? How can and should water subsidies be financed with or without the possibility of a cross-subsidy? The research community needs to take up this challenge.

[6] For the lowest income group, the subsidy is worth an estimate 8 per cent of household income (Gomez-Lobo 2001).

In respect of poverty reduction, the contribution of water is critical. Adequate supplies of affordable water offer multiple benefits including less time spent collecting water, reduced expenditure on this basic need and therefore additional household income to invest in food and other essentials, a lower disease burden with small health-related expenditures, and additional livelihood opportunities. Although comprehensive social protection for the poorest is unaffordable in many countries, access to basic services remains essential for equitable development.

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