Water and Sanitation Tariffs for the Poor

Guidance notes

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Designed and produced at WEDC
by Karen Betts, and Kay Davey

About these guidance notes and the series

These guidance notes are based on a collection of case studies undertaken in Africa, Asia and Latin America for the Department for International Development (DFID) research project *Public Private Partnerships and the Poor in Water and Sanitation* (R-7388 funded by DFID) and also supported by Suez Environment. Detailed reports of these case studies are published as a series of documents and can also be found on the project webpage:
http://www.lboro.ac.uk/departments/cv/wedc/projects/ppp-poor/

The purpose is to determine workable processes whereby the needs of the poor are promoted in strategies that encourage public-private partnerships (PPPs) in the provision of water supply and sanitation services. One of the key objectives is to fill some of the gaps that exist in evidence-based reporting of the facts and issues concerning the impact of PPP on poor consumers. This series of reports present the findings and cases studies based on both the pre-contract and operational phases of a number of PPP contracts. A broad perspective on PPPs has been taken, and situations where the public sector is acting in partnership with small-scale local entrepreneurs, or with NGOs employed in a private sector capacity have been included.

Many bilateral and multilateral agencies seek to foster involvement of the private sector through public-private partnerships as a means of delivering better water and sanitation services. Participation of the private sector is also seen as a key factor in meeting the Millennium Development Goals, particularly Goal 7 (Ensure Environmental Sustainability) and under which the Target 10 calls for halving the proportion of people without sustainable access to safe drinking water by 2015. Furthermore Target 11 demands for significant improvement in the lives of at least 100 million slum dwellers.

The number of poor people positively affected by PPP arrangements needs to grow soon to meet the Millennium Development Goals.

Who should read this guide and the series

This series and the guide should be of interest *inter alia* to:

- engineers and others with a professional interest in water supply and sanitation;
- managers and administrators involved in procurement and governance;
- policymakers who are developing strategies for PPP in water supply and sanitation; and
- staff of private sector firms, local government officials, NGOs and CBOs who are involved in the development and implementation of PPPs.

Preface

Increasing access to water and sanitation services for communities in the developing world is one of the major challenges in the global development agenda. It is not just a question of building and expanding new infrastructure to unserved areas. There is also a need to maintain and rehabilitate existing networks, to improve the service quality and protect the natural resources. The construction, operation and maintenance of a water system involve huge costs. Sharing these costs among all system customers fairly is a prerequisite to the sustainability of the system and to the quality of the service.

The legitimate costs of water services must be covered either by users through water charges or by direct government subsidies from taxpayers. Ultimately someone (the user) has to pay to ensure the service provision otherwise the water system will quickly fall into disrepair. The design of a sound cost recovery mechanism requires a clear comprehension of the different options and their impacts on the customer on the one side, on the service provider on the other. From these different options, some are more efficient than others as some ensure more solidarity towards poor families.

The present study focuses on tariffs with special attention to poor communities. In many developing countries, poor people are not connected to the official water distribution system but pay a high price, often higher than those who are connected. Expanding water and sanitation coverage and ensuring service quality and sustainability both require the implementation of a sound tariff policy (that may include subsidy mechanisms).

The review of existing tariff structure in several developing countries shows a clear link between highly subsidized water consumption and poor maintenance, and the absence of capacity to expand infrastructure to cope with urban growth, which primarily penalizes unsupplied poor households.

Reforming tariff structure to achieve cost recovery in not incompatible with the objective of making water available and affordable to all households, regardless of their economic resources. The current study explores and proposes different schemes that are both fair to the poorest households and provide sufficient incentives for the service provider to serve low-income areas.

Reforms in the water sector are needed to achieve water for all. A better understanding of cost recovery mechanisms and the application of a fairer tariff structure will contribute to these reforms and help to achieve what is both an international commitment and a dream for millions of people in the world.

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Special thanks to the people from the low-income settlements in the various case locations who have contributed to the research and have provided their perspectives on the issues. We feel greatly indebted to them.

Glossary and exchange rates

Block	A block tariff structure charges successive blocks of consumption at different volumetric rates per cubic metre. The block refers to the volume which may be charged at a particular tariff. A lifeline block is a first block of consumption charged at a very low rate (or not charged at all), and is supposed to meet the basic needs.
Capital charge	The annual cost of capital resources deployed. A narrow accountancy definition is the sum of depreciation and interest charges in respect of loans for capital works.
Collection ratio	Ratio of cash collected to the total water or sewerage charges recognised for a particular period. (A potentially misleading ratio if not fully defined. If calculated from movements in debtors, need to be clear whether bad debts have been deducted).
Cost of capital	The expected percentage return on their capital that providers of capital require if they are to supply funds to a company, given the risk category of the company's cash flows. (Passive investors are likely to charge a greater premium than active shareholders who may also benefit from construction or supply contracts with the company).
Covenants	In loan agreements, covenants are terms that seek to ensure that the borrower acts in the lender's best interests. For example, a typical covenant insists that the borrower has free cash flows that exceed the bare minimum needed to service the debt.
Depreciation	The reduction in value of an asset through use over an asset's life. An annual charge for depreciation is made in a company's accounts, as it represents one of the costs incurred in order to generate income, but it is not a cash flow. Depreciation is a capital charge.
Duration	The average time to make a payment to a provider of finance. A useful indicator of whether the financing is "long term" or not. (The term has a specific meaning in the context of bond finance).

Elasticity of demand	A measure of the responsiveness of the quantity demanded of a good or service to a change in any one of the variables (i.e. income, price, etc) influencing the quantity demanded. For example, pure price elasticity of demand is the proportionate change in quantity demanded divided by the proportionate change in price. If the price elasticity is -0.1, a doubling of price leads to a ten percent fall in demand.
Equity	1. The "risk bearing" part of a company's capital structure. Equity funds provided by an investor are such that the investor has only a residual claim on the assets and cash flows of the undertaking. ("Residual" means that the claim has lower rank than investors who contribute debt. Their returns are therefore exposed to more risk. In the event of bankruptcy, for example, equity is worthless). 2. Fairness in law
Externality	An effect of a transaction incurred or received by members of society but not taken into account by the transacting parties (e.g. improvements in river water quality may be seen as external to the transaction between sewerage charge payers and the utility). Such externalities may have a positive or negative impact on third parties.
Financing decision	Decision on the form of capital structure (i.e. the proportion of debt, equity and other forms of financing) to be adopted by a company.
Net present value (NPV)	The present value of benefits (or revenues) minus the present value of costs.
Present value (PV)	A sum that is equivalent to and may be exchanged today for a stream of expected future cash flows.
PSP	Private sector participation: involvement by the private sector for a declared period of time in the delivery of services that are currently and traditionally undertaken by the public sector. (Covers a wide range of contractual forms and exposures to risk on the part of the private sector).
PSP operator	In this report, term synonymous with the company formed to undertake private water supply or wastewater operations and/or investment.

Regressive	A change that transfers income or wealth from the less to the better off. The opposite of progressive.
Utility	1) A provider of water, sewerage, power or telecommunication etc services 2) Satisfaction derived from consumption of goods and services.
Willingness to pay	Survey techniques are used to establish willingness to pay (WTP) values in the absence of market prices.

Summary

This document on tariffs for the poor examines the different types of principal tariff structures that are available and discusses their impact on the poor, and how they can be made more fair and acceptable to the poor, involving subsidies if necessary. Incentives to the service providers are essential for improvements and expansion of services to the poor households. The paper also explores first time connection charges that can be a significant barrier to those without services. The paper is drafted from the perspective of tariff reform for private sector participation (PSP) concession contracts, but its concepts and ideas apply equally where services remain in the public sector.

Tariff designs seldom start from a blank sheet of paper, as some degree of charging or pricing of water will already have been in place. Designing good tariffs for the poor is therefore heavily reliant upon good management of an overall change process, which must assess where service provision presently stands and decide what provision is targeted for the future. This is mostly an evolutionary change process, but particularly if PSP arrangements form part of the change there is a need to set down firm tariff structures at a fixed date to define the sector revenues.

It is difficult for us not to look at tariffs and paying for water services from the perspective of a high-income country where access to water is universal, where water is readily affordable, where users generally pay promptly and where cross subsidisation is essentially absent. The conventional approach to recovering revenue through use-related tariffs is generally considered a fair distribution of costs over the user base. It embodies 'pay for use' and 'polluter pays' principles, but assumes that everybody has access to a broadly similar standard of service.

Conversely, we reason that if the poor in low-income countries are to have sustainable formal water services, low (entry level) tariffs should be available for lifeline services and that a degree of cross-subsidy by richer users is warranted. Also targeted subsidies from public authorities are suitable (For example Santiago do Chile)

Whether efficient mechanisms can be established to manage such cross-subsidies is a key question, and we concede there are administrative and logistical difficulties in identifying both rich and poor users at each end of the spectrum.

We are aware that there is a movement towards the simplification of tariff structures and volume related prices (fair tariffs) in emerging economies based on promoting understanding through price signals and providing for cost recovery. This contrasts with many high-income country structures (where multitudes of tariffs have emerged to suit varied customer usage in response to customer power), and we argue that with good information on consumer usage and household properties, and modern billing systems, similar wide tariff structures can also work in emerging economies. For metered usage this could range from top-level tariffs for the rich to entry level tariffs for the poor (thereby promoting the expansion of water services to the poor - however, care should be taken so that this does not create disincentive for operators). For unmetered usage, charges could be linked progressively with household rateable values.

The paper concentrates on water rather than sewerage. This bias reflects trends in PSP that in turn arise from the conflict between a low willingness to pay for sewerage but a high cost of provision. Sewerage tariffs are less well developed than those for water: pre-PSP charges are often very low and based on property size or value rather than on volumes of water consumed. PSP is likely to bring about a radical change in sewerage charging. The principles of sewerage tariff design in the PSP context do not however depart significantly from those for water.

Finally, in common with other aspects of reform of water services, the greatest scope for establishing equitable output and charges lies at the planning stage and the degree of commitment given to pro-poor policies. Once the arrangements are set in place it becomes progressively harder to implement a pro-poor policy unless these are contemplated and provided for in the regulatory mechanisms.

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Section 1

Introduction

1.1 Statement

In compiling this paper, WEDC and its partners have drawn upon their experience of designing tariff structures associated with PSP and reform in the water sector in both low– and medium– income countries. We do not attribute opinions to specific projects and we highlight adverse tariff features not as criticisms, but in the interests of sharing knowledge and improving services to the poor. Operational data for the water sector are widely accepted as being of limited quality, and subject to numerous variations in definition. To provide illustrations of the points in this paper, in addition to the sources mentioned in the bibliography, we have drawn mainly from the following three:

1. Asian Development Bank - Second Water Utilities Data Book - Asian and Pacific Region, October 1997
2. World Bank, TWUWS - Water and Wastewater Utilities - Indicators (2nd edition) - May 1996
3. Halcrow Group Limited - specific observations in the course of advisory services for water sector reform.

The use of this material is acknowledged here. Whilst much of the material appears to be old, we believe it serves to provide the necessary illustration. In any event, change in the water sector takes place slowly.

4. Field Visits to Jakarta, Manila, Buenos Aires, La Paz and Johannesburg, please see Appendix 1 as an example of sample analysis.

1.2 Definitions

In this paper the term "tariff" refers to payments made for access to and provision of water and sewerage services to domestic consumers. The term "poor" means

that expenditure on these services is significant for a substantial minority of households in the intended area of supply. Non-domestic charges are relevant, but only to the extent that they have a bearing on the level of domestic charges, and we have therefore concentrated on domestic tariffs. The presumption of tariff reform and a possible PSP contract implies a predominantly urban setting.

1.3 Scope

Our findings on tariff design and reform are mostly in the context of advisory commissions preparing for PSP which itself provides an opportunity for tariff and regulatory reform. However, the findings are equally applicable where supply and distribution remain within public sector supply.

PSP is predominantly in water rather than sanitation services - especially in low-income areas.

Similarly, we say little about pricing in the informal sector, or what can be termed the secondary market. This is because consumer prices in these markets are usually unregulated and outside the scope of the PSP contractual arrangements. However, we recognise that water pricing in the secondary market is of particular importance to the poor, and this is often their main source of water.

Section 2

Setting the scene

2.1 Rationale: what are we trying to achieve?

Poor households spend high proportions (typically in excess of 10 percent) of their income, and incur substantial costs that are not priced ("coping costs"), in order to obtain water fit for human use. A unit reduction in the price of water to the poor has a greater value to them than the same reduction to the better off. In economists' jargon, their incremental utility of income is higher and the economic benefits of providing them with services should receive a higher weight than supplying the rich. But high *economic* benefits to consumers do not necessarily translate into *financial* benefits for the supplier, for

- it is not necessarily cheaper to supply the poor in terms of cost per cubic metre of water delivered;
- the opportunity costs of existing arrangements (for example, carrying water from distant wells) do not translate into disposable income; and
- weak property rights and limited access to credit on the part of the poor mean a weak contractual basis for the provision of services to them.

PSP is typically a financial transaction between a public water supplier and a private company that is frequently undertaken by risk averse utilities backed by even more risk averse lenders. It would be uncommon for PSP to be exclusively focused on the poor.

PSP is part of a wider reform process. Adopting PSP amounts to tacit acceptance that the public sector approach is failing or more extremely has failed. However, the policy aims behind most PSP transactions continue to combine distributive goals (better coverage, higher standards of service) and efficiency goals (lower unit costs). Meeting *distributive* goals tends to generate poor returns (negative Net Present Values (NPVs)), while improving *efficiency* generates high returns

(positive NPVs). The hope is that the latter can cross subsidise the former, and also simultaneously yield a lower average cost service overall.

Thus the question at issue could be phrased: can tariff design (or more usually *reform*) turn provision of water services to the poor from a high risk, negative financial NPV transaction into a low risk, positive financial NPV transaction? Or, can tariff reform generate financial inducements that yield a good positive outcome for the poor?

This is the broad picture. Other tariff reform goals are:

1. the conservation message: sending appropriate price signals to consumers to ensure that people only purchase water services if the value to them exceeds the (full) cost of supplying the service. Another way of putting this is: set prices such that they reflect the long term costs of supply;

2. social acceptability and equity: everyone should be able to afford enough water to meet their basic needs. Increases should also not cause real hardship or widespread dissatisfaction with the reform process. They should be linked, as far as possible, to improved levels of service;

3. simplicity: tariffs should be easy (and cost effective) to administer and easy to understand; and

4. geographical uniformity - though this potentially conflicts with (1).

One observation at this point might be: are we expecting too much of water tariffs? In pursuit of multiple objectives, we might miss all of them. An important message then is: be sure of your goals before embarking upon reform.

Another observation is that of cost recovery. As a largely fixed cost and relatively capital intensive operation, the cost base of maintaining the provision of existing services is virtually fixed, whereas the incremental cost of supplying services to additional customers can be astronomical both in terms of initial CAPEX and ongoing OPEX. **A new question to be addressed is whether there is merit in over-recovery of costs through tariff mechanisms in order to build up reserves to support services to the poor?**

2.2 Sewerage services

We said above that PSP is biased towards water rather than sanitation. Why is this?

There are two main reasons. First, the pre-PSP mismatch between costs and revenues is usually even greater for sewerage services than it is for water. Additionally, surveys often show that respondents are willing to pay much less for sewerage than they are for water. Financially, then, there is little to attract the private sector into sewerage provision: economic benefits cannot readily be turned into cash flows.

Second, there are often institutional complexities. In many cities, sewerage is institutionally separate from water, with quite separate charging arrangements. (For example, in Colombo, Sri Lanka, although water is charged on a measured basis, sewerage is paid for largely from municipal property tax receipts). For this reason most of the private sector involvement in sewerage services has to date focused upon provision and operation of capital assets through BOT type concessions. Revenues from such arrangements derive from charges to municipalities directly rather than to individual customers and tariff issues are thus more obscure than those in water services.

Section 3

The metering decision

The question of metering domestic supplies is not a principal focus of this paper, but it cannot be ignored, as it effectively sub-divides tariffs into two groups. Popular with international financial institutions and accepted as given in many places, a decision to meter hitherto unmetered households is far from always the 'right' decision. Universal metering is most *likely* to be appropriate where:

- the incremental cost of serving new customers with the new introduction of water resources is very high, so there is a high payoff from bringing supply and demand into balance; and
- water quality is good and mains are pressurised continuously and adequately - which is *not* an inevitable state of affairs in many low-income countries.
- Consumption pattern is far from uniform and equity goals require that small consumers do not pay as much as high consumers.

It is *least* likely to be appropriate in circumstances where demand is falling (the case in some central and eastern European countries). It is *completely unsuitable* if supply is intermittent – a common situation in many low-income countries.

Box 3.1. Continuity of water supply

In the Asia Pacific region (1995) only 26 out of 50 utilities assessed provided a 24 hour water supply, with a number of major cities providing water for 6 hours per day and less.

In Trinidad and Tobago (1996), the continuity of water supply was assessed as between 30 and 40 percent of a full 24 hour service.

In Nairobi (2001) about 60% of consumers received a full 24 hrs a day service, 30% received water once in two days, while 10% received water once a week.

In Section 5 we discuss tariffs in the absence of metered domestic supplies.

In Section 6 we discuss the more numerous tariff features that exist with metered domestic supplies.

Box 3.2. Use of metering as a charging basis

About 70% of 58 utilities analysed by ADB and World Bank rely on household metering as a charging basis, but in the majority of these metering is incomplete. The distribution of charging methods in 50 cities in the Asia Pacific region is shown below:

	Charging basis as percent total				
Service type	Metered	Flat rate	Property tax	Combination	None
House connections	64	14	0	20	2
Industrial and commercial	70	4	0	24	2
Public taps and standpipes	36	27	6	9	21

Section 4

Tariffs in the absence of domestic consumer meters

If supply-demand balance considerations rule out metering - it simply represents poor value for money - redistributive goals can still be served, but only if there is a cost effective means of measuring and recording household income or wealth to differentiate or 'tag' the poor.

'Unmeasured' domestic tariffs distinguish between consumers on the basis of:

- service level as indicated by on-site facilities (standpipes, yard taps or internally plumbed);
- wealth based systems (rateable value, plot size, locality); or
- service level (usually pressure or hours of supply).

In Trinidad, the poor continuity of supply ruled out (for technical reasons) widespread metering; there were many charging categories, some of which distinguished between consumers on the basis of service level (standpipes, yard taps and internally plumbed) and some on the annual property tax value. None of these directly reflect actual volumetric consumption or use of the system.

Whilst wealth based systems appear attractive in that they avoid the high cost of metering (first time costs, cyclic replacement and meter reading), they do inherently rely on measurements of a surrogate to reflect consumption. Such surrogates can be physical (house size, yard size, size of connection pipe, floor area etc), which may correspond to demand for water services. However, there can be serious deficiencies in obtaining the relevant data and in the accuracy of the surrogate relationship in defining water use. It is possible to obtain these data from other sources, such as housing tenancy and the land register, but in reality such data are not usually available, and the reliance on other sources can cause

delay and frustration. An alternative to this is self declaration, but this has obvious flaws. It is important to devise mechanisms for regular updating of key information.

Section 5

Metered tariff features

Five different types of metered tariffs are discussed in this section.

5.1 Volumetric rates

Either single or multiple volumetric charges per billed cubic metre are feasible. Multiple rates offer an approach to serving both redistributive goals and maintaining financial incentives. With strong support from the Inter-American Development Bank (IADB), the water utility in Georgetown, the capital of Guyana, has introduced such a scheme. (A management contract is under preparation there, and reforming tariffs was seen as part of the overall reform process). The Georgetown scheme's features (see Figure 5.1 below) are:

- five fixed volumetric rates per cubic metre, with the top rate meeting the long run marginal cost (LRMC) of supply and being 1.8 times the lowest rate;
- a household is allocated a volumetric rate depending on its rateable value (there are five rateable value bands); and
- the utility receives a targeted top up subsidy from government in respect of supplies to consumers in the lowest two bands (bands 1 and 2). The subsidy brings the income to the utility to the same level as it would be from supplying consumers in band 3.

The scheme represents a much better approach to subsidy than its predecessor (a cash flow subsidy to the utility), in that it is targeted but maintains financial incentives to supply. **It depends crucially on having a working rateable value system, or some other cost effective means of identifying poor households, which is the same problem faced by non-metered tariffs.**

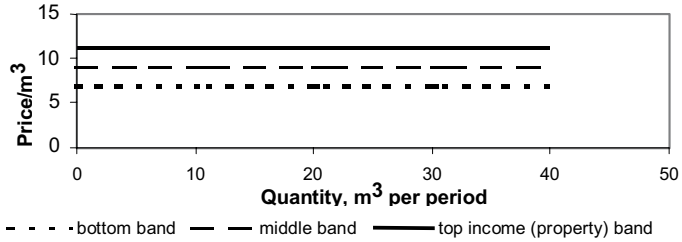


Figure 5.1. Multiple volumetric rates: one rate for all m^3 that depends only on poverty indicator

5.2 Block charges

Block structures charge successive blocks of consumption at different volumetric rates per cubic metre (see Figure 5.2 below). *Block charges mean that a time interval has to be part of the tariff specification*. In Sri Lanka, where a block structure is in force, meter readers carry tables in large print to show consumers how readings are adjusted to comply with the standard reading interval of a month.

Falling block domestic tariffs are unusual but not unknown. There may occasionally be a case for them, for example if demand is falling as a result of declining economic activity, but the circumstances are unlikely to be applicable to PSPs in low– or middle– income countries.

Rising block tariffs, on the other hand, are extremely common in many countries. Amongst many examples are Sri Lanka (national), Botswana (Gaborone), Namibia (Walvis Bay, Windhoek). Motives vary. In Botswana and Namibia the aim is to ensure an efficient pricing signal in the face of potential water scarcity and the very high costs of adding capacity. A steeply rising block ensures that those demanding most water are in the highest blocks and are meeting the cost of providing the additional capacity, while those consuming least water are in the lower blocks and are meeting the average costs of today's supply. In Sri Lanka the motivation seems to be redistributive. The result is that almost all domestic consumers pay much less than average supply costs, with commerce, industry and public sector institutions acting as sources of cross subsidy.

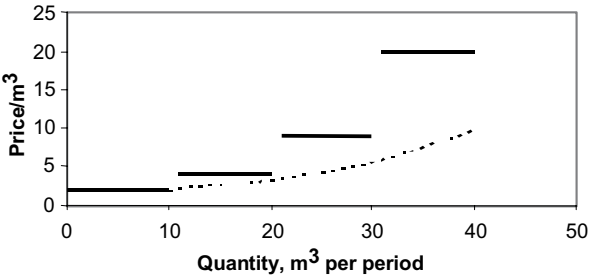


Figure 5.2. Rising block tariff

The lowest block of consumption is sometimes termed a "lifeline" block. There is no consensus on the size of this block, but they are usually rather larger than implied by minimum tolerable levels of service. A representative range is $5m^3$/ month (example: Botswana, Gaborone) to $20m^3$/month (Delhi), with $10m^3$ being typical. Some utilities charge nothing for the lifeline block (Durban, South Africa, provides the first 6 m^3 in a month free of charge), but most make some charge.

Rising blocks are popular because they are seen as "fair". Despite this popularity, they have many drawbacks, especially if the structure is steep, and intended to serve distributive rather than signalling goals. Drawbacks include:

- operationally challenging: it is essential to have reliable, tamper proof and well maintained meters, that are read frequently and close to their due date;
- can close off options: once a free (or very cheap) lifeline block has been introduced, there will be strong resistance to changes;
- as redistributive devices their performance is unimpressive, because:
  - all connected households benefit from a lifeline block (see the average charge curve in the Figure 5.3 below); and when the lifeline block is wide, households consuming the full block benefit from more subsidies than others.

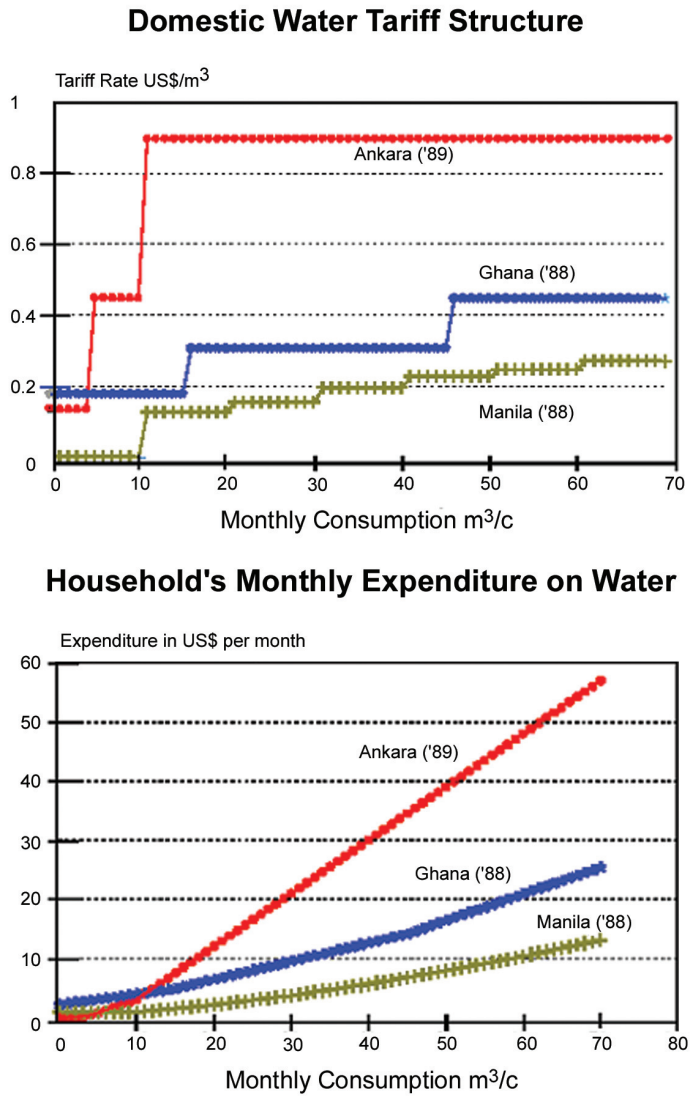


Figure 5.3. Illustration of rising blocks and monthly expenditure

- small urban households benefit disproportionately, whereas poverty is usually associated with large household sizes;

- they do not work where more than one household draws water via a single meter; and

- the need for cross subsidy from somewhere tends to drive non-domestic tariffs to the level where some non-domestic users simply develop their own supplies.

- from the utility's perspective rising blocks are:

  - costly to operate, with billing and collection costs being a high proportion of revenue for many small consumers (**which may discourage extending provision to the poor**); and

  - (if steep) introduce an uncertainty in the relationship between tariff and income.

5.3 Fixed charges

A high proportion of a water utility's costs are fixed in the short run (that is, capacity cannot be changed rapidly in response to changes in demand, nor in practice can labour costs). In many developing countries a high proportion of meters may be broken or provide highly erroneous readings (poor water quality, intermittent supply, vandalism). For these reasons utility finance directors are often keen on setting substantial fixed or minimum charges.

Economic arguments suggest that fixed charges should recover no more than consumer related costs (i.e. costs related to the number of consumers rather than volumes sold). Guidance in England and Wales implies that the fixed component of a bill should be around 15 percent of the average household bill, although we understand that fixed costs currently average some 20-25 percent of average household bills. *Minimum* charges may be convenient for utilities, but have no merit from the consumer's point of view.

5.4 Tariff differentiation by activity of user

Many countries charge according to the activity of the user, and it is common as a minimum to recognise and distinguish domestic, commercial and industrial users. Sri Lanka's National Water Supply and Drainage Board is an extreme case: it recognises seventeen categories of metered user.

Charging non-domestic users more than households is nearly universal in developing countries and in the former centrally planned economies (in Latvia, commercial water users are charged on average 1.8 times the tariff applied to households). There is no economic rationale to this. **Economies of scale in distribution, lower diurnal demand variation and a higher price elasticity all suggest that non-domestic consumers should *not* be charged at a higher rate.** This has been formalised in England and Wales, where the regulator now accepts discounts for "large users" (those using more than 100,000 m^3 a year).

Notwithstanding this, companies in England and Wales must ensure that charges to large users are not unduly preferential or unduly discriminating, and this opens the debate to two opposing views:

On the one hand, maintaining a premium on the price charged to non-domestic users may be an unwise move from a financial perspective, as non-domestic users are more price sensitive, and are able to mount effective protest. Some of the larger users may also develop their own supplies, as they enjoy economies of scale similar to those available to the utility. Although private abstraction may, according to law, need a licence, such laws are often weakly enforced and may in any event not compensate for the negative externalities of large private abstractions. **In other words: you risk losing large users if there is too great a price premium.**

However, on the other hand, if premiums on prices do cause large users to develop their own supplies, this will (in theory) release spare resource or network capacity to supply new customers (including the poor) who may have hitherto been denied access due to resource or network capacity constraints. Also, if economic redistribution is not going to be charged to non-domestic users, then domestic customers will have to pay more if there is to be a subsidy for the poor. **In other words: if a subsidy does not come from non-domestic users, it will have to come from somewhere else.**

These two opposing views are illustrated in Figure 5.4 and Figure 5.5 below.

These two views highlight the important need for a detailed political and social policy to be integrated within tariff design and the tariff reform process.

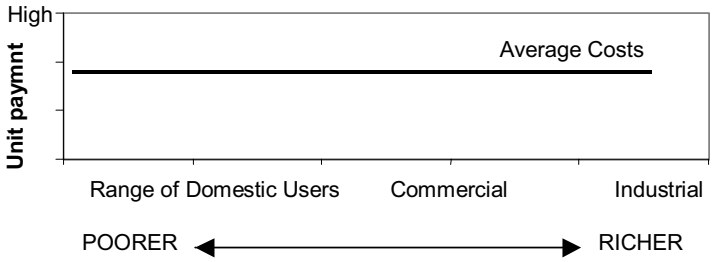


Figure 5.4. Unit payment for water the same for all users

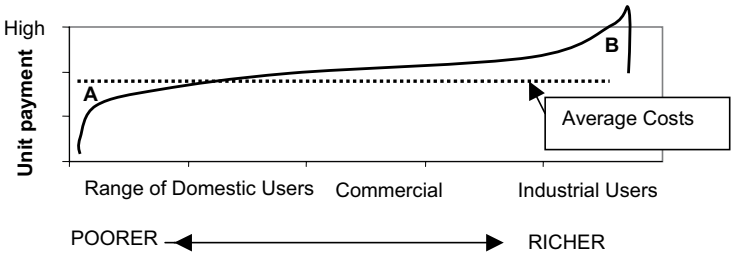


Figure 5.5. Unit payment varies for activity of user

(Premium 'B' equates to subsidy 'A')

5.5 Tariff differentiation by level of service

We need to differentiate between:

- provision of a lower level of service (especially pressure) and charging for it at a rate that reflects the lower cost imposed on the utility; and
- charging different rates depending on the level of on-site service (yard tap, internal plumbing etc), which has more to do with redistributive goals than with lower costs.

Box 5.1. Cross subsidisation of domestic tariffs by industry

Out of 47 utilities analysed in the Asia Pacific region the ratio of industrial/domestic cost was as shown in the table:

Ratio of industrial to domestic tariff	1	1 to 2	2 to 3	3 to 4	4 to 20	>20
Number of utilities	5	17	11	7	6	1

Durban, South Africa, practises the first of these, but does not plan to extend it. Trinidad (mentioned previously) practises the latter. The utility there (WASA) has found it difficult to keep track of actual on-site arrangements. Table 5.1 overleaf shows the broad spectrum of levels of on-site service that are possible, and tariffs are then related to each category of service.

Table 5.1. Spectrum of levels of water and sanitation services[1]

Level of service	Service provided	Water supply	Sanitation
L5	Full service (high use)	Metered connection for in-house supply (high use).	Full waterborne sanitation. Each dwelling connected to sewer with full facilities available.
L4	Full service level	Metered connection for in-house supply.	Full waterborne sanitation. Each dwelling connected to sewer with full facilities available.
L3	Medium service level	Metered standpipe per site.	Toilet with superstructure and washbasin connected to waterborne system.
L2	Low service level	One metered standpipe within 100m of a household or low volume yard connection	VIP latrine, including superstructure
L1	Minimum service level	One metered standpipe within 200m of a house or Communal Tank	VIP latrine, including superstructure
L0	Emergency and temporary settlement service levels	Temporary storage tanks with communal taps, or metered standpipes or water tankers	One chemical toilet or shared VIP to be provided for every 7 dwellings or shared ablution blocks

1. Source: Halcrow: PSP contract in an emerging economy country (unpublished).

Section 6

Summary of tariff features

Table 6.1 below summarises the principal features of various tariff structures and their relevance to the poor. Although not a particular focus of this paper, an important and related issue is: *how do we identify those we wish to subsidise? Or, put another way, how do we 'tag' the poor?* For unless the poor can be both efficiently and cost effectively identified, we are left with 'within tariff' solutions. The only 'within tariff' candidates are rising blocks or cross subsidies from non-domestic consumers, and it is evident from the foregoing discussion that neither is an efficient means of targeting the poor.

Table 6.1. Tariff features and the poor - summary

Category	Tariff feature or type	Suited to the poor
Unmetered	1 Unmeasured tariff (no household metering)	Yes, provided technical and economic case is sound and a suitable means of "tagging" the poor is available.Can be problems with households not wishing to be labelled as being poor.
Metered	2 Simple volumetric rates	Multiple fixed rates can be attractive: • top up to target rate per unit if poverty indicator available· • top up payment received by utility on evidence that consumption has taken place· • financially satisfactory
	3 Rising block with "lifeline"	No: • inefficient at targeting· • uncertain link between tariff and revenue (especially if block structure is steep • likely to be difficult to move to cost recovery under PSP
	4 Rising block with strong conservation signal	May be financially satisfactory if high level of cost recovery from lower blocks.
	5 Fixed/minimum charges	Yes, with poverty discriminator, provided charge set to cover *only* consumer related costs.
	6 Higher non-domestic charges	Many disadvantages: • is not targeted • does not reflect costs imposed on the utility • financially unwise • dilution effect as the market expands into poor domestic areas will strongly discourage expansion But advantages: • subsidy (if desired) has to come from somewhere • potential for supply to poor consumers hitherto denied access
	7 Different charges for water and sewerage	Only poverty issue is low willingness to pay for sewerage and its higher administrative cost
	8 Differentiation by level of service	Little scope for efficient targeting

Section 7

Tariff reform in the context of private sector participation

7.1 Existing tariffs can stall a PSP transaction

In practice, the preparatory work for a PSP transaction inherits a public sector tariff design. Almost always this design includes redistributive elements. A typical arrangement will be:

- a rising block domestic tariff with a lifeline block, perhaps with a minimum monthly charge;
- a relatively much higher non-domestic tariff; and
- connection charges that are high relative to income levels.

The PSP advisory is in an unenviable position. If today's tariffs cover today's operation and maintenance costs - and in many cases they do not - it will be by virtue of income from non-domestic consumers. In concession contracts the private operator is expected to improve services to existing users and extend services to a large, outlying area of less well off domestic consumers.

There are two pressures: a) quality enhancements, resource developments and new distribution systems all increase costs enormously, while b) incremental income per new consumer falls, limiting expansion incentive.

Under these conditions PSP may simply not work: the extent of tariff reform will be unpalatable to government, and the consequences too uncertain to contemplate. *Gradual* reform over a long period may be possible within the framework of a PSP contract, but only if the initial tariff arrangement is basically satisfactory as far as cost recovery is concerned.

There are many examples where governments have retreated from their sector reform policies because phasing out subsidies and the corresponding increases in tariffs were too onerous socially and politically. Conversely, we are aware of certain large concessions offering customers tariff reductions as a result of the competitive selection process. Therefore, in reality, tariff issues can make or break concessions.

Box 7.1. Tariff changes as an obstacle to PSP

Tariff levels frequently present themselves as an obstacle to the introduction of PSP at the time of strategic study or options (feasibility) analysis at the start of the transaction preparation phase. Because of the lack of prior analysis, and the limited time available for study and transaction preparation, governments do not have time to fully consider, let alone implement, possible recommendations on tariff restructuring that might benefit the poor. For simplicity of presentation, tariffs required to enable service expansion and financial self-sustainability are often expressed in terms of a percentage increase in average tariffs or household bills. Such increases are usually large, and tend to become headline figures that may deter politicians and may be seized upon by the media as consequences of PSP. Avoiding such misconceptions, and explaining the costs and benefits effectively, requires better presentation of results by advisors, which in turn will be promoted by more effective data and preliminary study of consumer characteristics and possible tariff re-structuring. Examples from past PSP studies include:

Karachi (1996) - the headline became the requirement for tariffs to be 300% of the then current average level, as estimated at the start of the transaction preparation of a concession OR lease.

Durban (2000) - from a short strategic study, the peak ratio of average future tariff to current tariff was estimated at 166% for a PSP concession.

Nairobi (2002) - strategic study estimated that future tariffs would need to rise to around 200% of the current ones, although this included a substantial (40%) increase already approved for the public utility, but not yet implemented.

Greater Negombo, Sri Lanka, on-going - options analysis for transaction preparation indicated future average tariff of over 200% of current levels for a concession and marginally less than 200% for a lease.

Lima (2000) - ref Alcazar, L., Xu, L.C., and Zuluaga, A.M. (2000) Institutions, politics, and contracts: the attempt to privatize the water and sanitation utility of Lima, Peru.

7.2 Introducing tariff options

Tariff reform presents opportunities for innovative new tariff mechanisms such as off-peak tariffs, smart meters, pre-pay tokens, vending boxes, household collection and bank debits. New technology allows these innovative tariffs to be considered, and they are designed to be cheaper to administer and more responsive to customers needs. However, in many cases the high cost of such new technology in the water sector can increase charges. Lessons can also be drawn from tariff reforms in other utilities, together with the possibility of introducing multi-utility billings.

Tariff reform mainly takes place on a long timescale as evolutionary changes are generally preferred to abrupt ones. There could be a relatively smooth adoption of new tariff structures in certain supply areas, but much slower progress in other ones, and managing this process will require considerable skill, diligence and political will.

New tariff structures typically require parcels of information on consumption and on properties (as in practical terms, water operators supply properties, not people). Ensuring that there are adequate data on consumption and properties will be a vital and large undertaking. (Also refer to Section 11).

7.3 Converting tariffs into cash

The best tariff designs are worthless unless consumers exchange cash for services. Collection ratios in low-income countries are often low (values in the range 65-80 percent are common, as against 96-99 percent in many western countries) and improving them is almost always a goal of PSP and tariff reform.

Low collection ratios are not usually the result of poor tariff design, but the tariff reform process should at least include an assessment of related issues such as billing accuracy, user friendly payment facilities, measures to reduce collusion between consumers and meter readers, and customer satisfaction surveys.

There are instances where attempts to improve collection ratios through a combination of revised tariff structures and revenue management processes have in fact resulted in increased customer indebtedness and reduced cash flows to the utility.

In the case of metered supplies the main lesson for tariff design is: be wary of very low charges to large numbers of households. If charges are lower than

Box 7.2. Typical collection ratios

Typical collection ratios assessed during PSP transaction preparation work have been as shown below. However it should be noted that the measure can be defined in various ways, and that a complete analysis depends also on the age of accounts receivable:

Karachi (1996) - ratio of billings to receipts 35% for retail customers and assumed to rise to 80% after major service improvements to be brought by PSP

Maputo (1997) - ratio of billings to receipts 70% prior to PSP

Durban (2000) - 80% of billings expected to be received in current year and 17% in subsequent year

Nairobi (2002) - estimated ratio of billings to receipts 58%.

the cost of meter reading and billing, readings and billing will become infrequent or may cease altogether. The result can be:

- failure to spot a substantial increase in consumption;
- unreported leaks;
- unreported changes to the consumer's circumstances (e.g., no longer a domestic property); or
- a loss of commitment to provide a reasonable service to consumers.

It should be noted that such results will have a substantial impact on the efficiency of network operation and maintenance provisions, which may lead to further non-payment problems.

In the case of households without meters the main lesson is: be wary of losing touch with the consumers. Water service billings are often combined with billings for other municipal services, which means:

- the extent of water charge debtors cannot be easily established; and
- though cost effective, the water utility officials pay no visits to their customers.

These outcomes can mean that the water company loses sight of both non-paying and paying consumers.

Box 7.3. Illustration of the extent of payment facilities

An analysis of 47 utilities in the Asia Pacific region identified 5 arrangements for payment:

- bill collector
- utility office
- bank
- post office
- other

The predominant methods are through the utility office (34 utilities) or a bank (32 utilities). Only 14 utilities enabled payment through a bill collector. The distribution of availability of multiple methods was as shown below.

Number of methods	1	2	3	4	5
Number of utilities offering methods	14	16	12	4	1

Limited information appears to be available on methods specifically designed to aid the poor, but these include: water kiosks (Gaza and more generally), grouped and lockable household taps (Manila), and the low tank system in Durban. Key elements of the more successful systems appear to be the ability to pay for small quantities in cash, and an organisation that involves personal supervision at the community level.

7.4 Regulation of tariff setting

The setting of tariff structures and the monitoring of revenue and expenditure will normally be subject to a degree of regulation that will be concerned with:

- ensuring that tariffs are effectively designed and applied
- checking that revenue stays within the water and sanitation sector
- regulating the cross-subsidisation between different users and customers (if applicable)
- updating tariffs in line with inflation or other factors to an agreed protocol.

Regulation is therefore a vital and integral part of the tariff reform process.

Section 8

Initial connection charges

8.1 Existing barriers

High initial charges are frequently cited as barriers to access, as utilities raise a variety of charges on first connection. Examples of these charges include:

- a security deposit (which is commonly not returned);
- a connection fee that may either be unrelated to the cost of making the connection or be based on lengths of pipe laid etc;
- the cost of the meter and meter box;
- an "administration fee" that may be itemised separately or added as a percentage to connection costs; and
- an infrastructure charge related to the cost of additional capacity (new resources or additional system capacity).

These charges can be highly regressive:

- infrastructure charges involve a transfer of wealth from new (and probably poorer) consumers to existing (better off) consumers, while the behaviour of the latter is equally responsible for the need for new capacity; and
- the poor will have little capital to draw on, and weak access to credit for making large one-off payments.

It is also reasonable to assume that high charges have the additional unwanted effect of encouraging illegal connections.

Reform of connection charges is frequently recommended, and some donors are keen on their abolition. Complete abolition may be unwise, though, as it is likely to lead to (a) a flood of new applications that the utility cannot handle, and (b) demands for refunds by those who have recently paid for connections. The utility

also has a legitimate concern that a new consumer is creditworthy. In the absence of developed country credit checks, the ability to meet connection charges is a sensible proxy (although this may be an unnecessary hurdle for the poor).

8.2 Practical reform

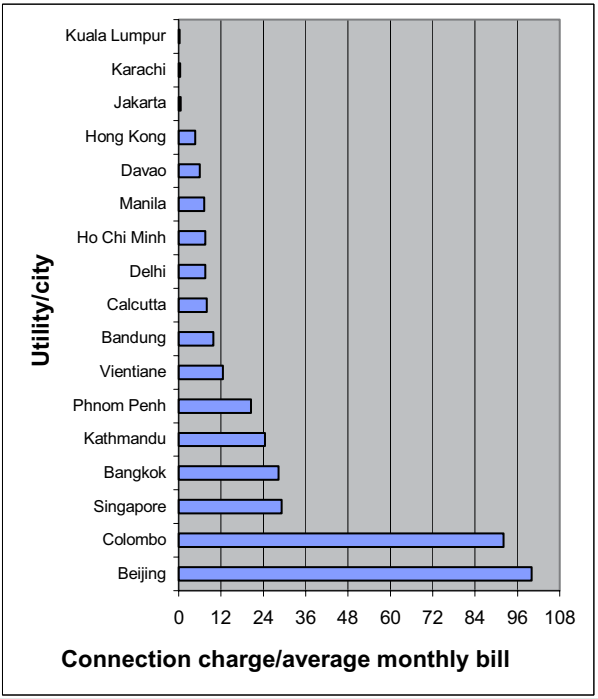
Practical reform of connection charges could include:

- abolition of deposits and infrastructure charges, but retention of a connection charge;
- occasional offers of discounted connection charges to persuade people to become legally registered (not least because poor connections to mains are a major source of leaks and contamination);
- connection charges set to a uniform level irrespective of the cost involved. (Rather than make a large reduction and arouse resentment amongst recent payers, allow inflation to erode the real value of the charge);
- formalised arrangements whereby labour is provided by the householder in return for a price reduction (though given the low price of labour and the need for proper supervision of the connection to the main, the reduction might not be large);
- arrangements that allow payments to be spread or added to bills. (Many utilities already allow some form of instalment plan, which effectively gives credit to customers). Micro credit is an alternative, but generally a more expensive one, as credit at the company cost of capital should be more advantageous;
- assertion that the meter belongs to the utility, as consumers who believe that they own the meter will feel justified in removing or tampering with it; and
- a mechanism to ensure the quality of the connection itself.

Connection charges may be a suitable vehicle for subsidy or cross-subsidy. An initial payment to the utility for making the connection would be attractive to the utility, but, ideally, the incentive should be in return for providing and maintaining the service.

Box 8.1. Examples of connection fees

The chart illustrates connection fees for a sample of utilities from the Asia Pacific region in relation to the average monthly household bill (assuming consumption of about 17 cu m per month)



Section 9

Calculating tariffs

9.1 Approach

There can be two levels of analysis:

- a high level analysis, where the interest is in the general level of tariff needed to achieve financial goals, taking the existing tariff structure as given. A focus of this work will be the general increase in charges that this will entail; and
- a more detailed analysis that examines whether a change in the existing tariff structure would be beneficial.

The decision on maintaining the existing tariff structure or developing a new one has a large political impact and this is therefore a key policy issue to establish early on in the tariff reform process.

9.2 Analysis

Post-PSP, water utilities are invariably subject to a degree of regulation. Whatever the owners' eventual profits, their proposed income stream (and tariffs) has to have a stated basis in terms of allowed costs, given a target set of outputs (numbers of households, levels of service etc). There are many approaches to defining the level of an operator's remuneration and tariff setting, and the process is illustrated below.

Operating expenditure includes bad debts, taxes and any fees payable for use of existing assets.

The tariff setting process is normally a model of required revenue streams for a given set of project outputs (coverage etc, converted into a capital programme) and cost of capital.

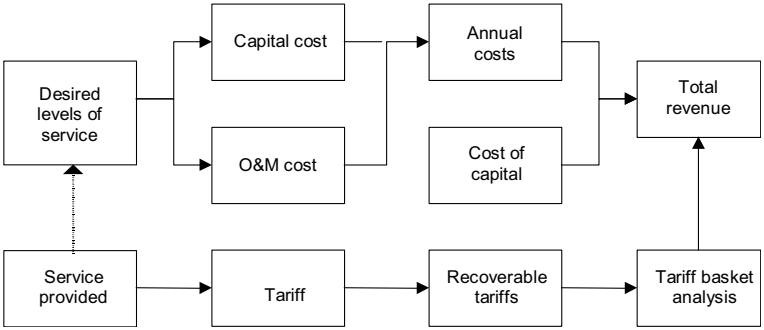


Figure 9.1. Tariff setting process

With some effort, iteration can be used to run the process in reverse, i.e. estimate the project outputs that are possible for a given revenue stream.

Section 10

Information requirements

Table 10.1 overleaf lists information requirements for tariff reform.

The list is divided into three sections: information about consumers, information about current tariffs, and information about obstacles to reform. Clearly it is the answer to this last question that determines whether there is any point in collecting information about consumers or the performance of current tariffs.

For any given municipality, information requirements are often unique as the availability and quality of existing data varies widely, and changes with time. However, the table provides a means of identifying the scale and complexity of information required, and can therefore be used as a planning tool.

Table 10.1. Information requirements for tariff reform

Subject	Characteristic	Requirement	Commentary
Consumers (both existing and future)	Whether "poor"	A cost effective means of identifying poor households that would be available to the utility	Without this, targeting the poor reduces to "within tariff" solutions or area based solutions based on evident poverty.
	Household income or expenditure	*Ideally:* a *spatial* representation of income across the supply area *Adequate:* income distribution of the current or (better) intended supply area If the potential area of supply is changing or has changed, why?	Income or expenditure data are seldom available except on a national or regional basis and are often out of date and unreliable (at best recognising only the *formal* economy). Having the data in a general way across the supply area is of limited benefit (enables "percentage affordability" questions to be answered). Spatial data are much more useful. The question concerning population changes is aimed at eliciting whether incomes are growing or expected to grow faster or slower than the national average. This is an ambitious aim in many circumstances.
	Change in income and demand pattern as coverage increases	Who has no public supply at present? Can they be described?	Is the market likely to be diluted as service area expands? If so (and this is common) then the issue of incentives to supply becomes important.
	Willingness to pay for a piped service or an improved service	A willingness to pay survey	WTP surveys are expensive and time consuming. Many PSP transactions are prepared without them. Their principal value is insight into the propensity to connect on the part of those groups currently without a piped supply. This propensity will be revealed as a PSP arrangement unfolds, or may be available from attempts by others to extend supplies into new areas.

Table 10.1. Information requirements for tariff reform *(Continued)*

Subject	Characteristic	Requirement	Commentary
Current tariff	Distributional characteristics	Which consumer groups are the principal contributors to revenue?	If income is skewed towards a small group of consumers (typically non-domestic consumers), then substantial re-balancing will almost certainly be needed. Always difficult and risky, a private operator will be keen that this exercise takes place well before the transaction.
	Cost recovery/ signalling characteristics	What proportion of costs (with and without capital charges) are recovered? Is there a strong signalling element (e.g. with most users paying close to average costs and high users meeting capacity expansion costs)? Are marginal expansion costs high compared with average costs?	If most users pay close to average costs, prospects for PSP are heightened.
	Connection charges	How are they related to costs? Are they high relative to income? Is there evidence that they discourage legal connection?	Connection charges are a useful vehicle for subsidy and may be easier to vary than volumetric charges.
	Reliability of sales volumes?	How many pay minimum charges and why - is it because meters are faulty or not read? Is there evidence of collusion between readers and consumers (are readers' routes varied?). How often does utility replace meters? Meter condition survey.	Much faith is placed in sales volumes during the preparation of a transaction, but they are often highly unreliable.

Table 10.1. Information requirements for tariff reform *(Continued)*

Subject	Characteristic	Requirement	Commentary
Tariff reform	Obstacles	Legal, regulatory, contractual and political obstacles to making changes before or during a PSP arrangement.	It is often politically difficult to make substantial changes to a tariff structure as part of a PSP transaction, since changes inevitably generate both winners and losers and their reactions will delay the transaction. It may also be unwise, as unpredictable results expose the operator to more risk. Reforms at a review during the term of a PSP contract may be possible, subject to regulatory and contractual limitations. Clearly a reform that is undertaken at the regulator's request may have to be accompanied by indemnity against a negative financial outcome for the operator.

Section 11

Sewerage tariffs

11.1 Introduction

We noted in Section 2.2 that PSP in water services has traditionally attracted far more interest than PSP in sewerage services. In this chapter we explore the particular considerations that apply to setting prices for sewerage services under PSP. **Sewerage tariffs are less well developed than those for water: pre-PSP charges are often very low and based on property size or value rather than on volumes of water consumed. PSP is likely to bring about a radical change in sewerage charging.**

11.2 Pre-PSP provision of sewerage services

When compared with water, the pre-PSP provision of sewerage services is typically characterised by:

- lower coverage, often confined to the old urban core and often of poor standard;
- a plethora of low-cost single household solutions (septic tanks, pit latrines etc) in newer urban areas;
- institutional arrangements that are more akin to municipal service delivery;
- arising from the above, less clarity over costs and revenues;
- very low charges, often levied as a local property tax; and
- large operating deficits.

11.3 The role of the private sector

PSP in the water sector is usually expected to achieve high levels of coverage: it is expected that a centralised piped treated supply will be the rule and not the

exception. Convergence of costs and willingness-to-pay usually make high coverage an achievable objective.

We need to be more circumspect when considering private sewerage provision, however. First provision of full waterborne sewerage is extremely costly and certain to exceed willingness to pay in all but the highest income areas. Elsewhere it may be necessary to re-think the role of the private sector. This role could include:

- support for and co-operation with NGOs;
- provision of transport and treatment facilities for septage; and
- selling of septic tank emptying services insofar as existing service provision needs reform.

11.4 Tariff issues

The principles of tariff design for waterborne sewerage do not differ from those for water; the main issue is the likely large change compared with the pre-PSP position. However strong the economic arguments in favour of minimising any fixed charge element (see Table 6.1), the high fixed costs of sewerage and sewage treatment will tempt utilities to pass these through as high fixed charges. This temptation will be supported by the concerns of lenders, who will want to see as certain an income stream as possible.

11.5 Compulsory connection

Many countries make it compulsory to connect to new sewerage, even for a household that has a properly functioning septic tank. The arguments for this run as follows:

- treatment works processes may not function properly if loads are much less than those for which they were designed; and
- an element of compulsion may be needed to persuade households to pay for the communal rather than purely private benefits of sewerage.

While these arguments have their merits, they strongly suggest that sewerage and sewage treatment should as far as possible be introduced only where there is clear demand for the service at a price that reflects the costs of provision.

Section 12

Conclusion

Given clear goals, care and consensus, tariffs can be reformed for the better. But there is no magic solution. Table 12.1 summarises the discussion in this paper by attempting to guide the reader from a current tariff to one that is "better", bearing in mind the objectives set out in Section 3.

When reading the table, bear in mind that:

- **not all tariff structures need changing;**
- **there may in practice be little scope to make significant changes *during preparation* of a PSP transaction; and**
- **scope for *subsequent* changes will depend on the terms of the operator's contract and regulatory arrangements. There is no reason why gradual reform should not be incorporated into the PSP contract, provided it can be specified unambiguously.**

Finally, it should be noted that tariff reform can take place separately from any PSP transaction, but it is the interest in PSP arrangements that is now pushing forward tariff reform.

Table 12.1. Conclusion: tariff reform

Today's tariff	Considerations	Move to...	Information requirements relevant to decision...
Unmeasured tariff	Poor water quality or intermittent supply *and* long run costs not significantly different from today's average costs	May be no good case for metering Main areas for reform: simplification and ensuring that differentials are targeted	Incremental costs of supply. Incremental costs of improving water quality to point where meters function. Do today's tariffs represent an efficient and cost effective means of identifying the poor? Is there an alternative means?
	Quality adequate *and* long run costs high enough to justify investment in metering	Move to metered tariff with simplest possible set of charges consistent with subsidy policy	Incremental costs etc as above.
Measured tariff with steeply rising blocks	Non-domestic consumers face much higher charges than households and contribute a large share of revenue. As a result expanding into low-income domestic areas is unattractive. *In its extreme form, such a structure can stall PSP.* However, if cross subsidy for the poor is desired, funding has to come from some source.	Ideally, reform the structure - for example multiple volumetric rates if rates can be linked to income or wealth.	Distributional characteristics. Willingness to pay for a new supply in currently unserved areas. Assessment of gap between this and commercial required tariffs. Can a subsidy mechanism be devised that closes the gap, provides incentives, is efficient and cost effective?
	Structure less redistributive: average charge per m^3 faced by household close to average costs.	Present structure may be basically OK, but extension into new areas expected to pose affordability problems. Reform: try and preserve existing structure and focus on subsidy mechanisms that don't distort it.	WTP for a new supply in currently unserved areas. Assessment of gap between this and implications of current structure. Can a subsidy mechanism be devised that preserves structure and meets other subsidy criteria?

Table 12.1. Conclusion: tariff reform (Continued)

Today's tariff	Considerations	Move to...	Information requirements relevant to decision...
Measured tariff with single or multiple volumetric rates	Extent of cross subsidy, especially from non domestic consumers	Limited reform: some harmonisation between non-domestic and domestic users	Distributional characteristics
Measured tariff with dominant fixed or minimum charges	May be a case where domestic metered tariff has effectively "lapsed" - most income is from fixed charges	Revisit arguments over metering (see above)	As for metering decision

Appendix 1

Tariffs - Suez Environment 2001

Database: 70 operations (covering 60 million consumers in 22 countries)

Including developing countries (Latin America, Asia and Africa): 17 operations covering 37 million consumers

Tariff structure is usually inherited from the public authorities

Appendix 1: Tariffs - Suez Environment 2001

Population served by type of charging basis:			
Volumetric: 73% Non volumetric: 27%			
Per type of water rates structures:	**Operations**		**Population served**
	Total	*Dev. countries*	*Total*
Constant rates per m^3:	50%	30%	40%
Inclining block rates:	45%	70%	57%
Declining block rates:	5%		3%

Appendix 1:

IBT[1] (28 op): Presence of a fixed charge in the water tariff: 76% of the operations			
Number of blocks:		2: 21% 3: 25% 4: 21% 5: 18% >5: 15%	
Size of "lifeline block"		≤5m3: 11% 6-10 m3: 56% 11-20 m3: 2% 21-30 m3: 9% Variable: 22%	
Tariff structure of the Case studies:			
	Water rates for HH[2]/non HH	**Dominant charging base**	**Sewage bill**
Jakarta	IBT 3 blocks / Constant	Volumetric w/fixed charge	No
Buenos Aires	Constant / Constant	Non volumetric (15% vol. w/fixed charge)	Yes
Manila	IBT 9 blocks / IBT	Volumetric w/fixed charge	Yes
Johannesburg	IBT 6 blocks / Constant	Volumetric without fixed charge	Yes
La Paz	IBT 4 blocks / Constant	Volumetric without fixed charge	No

1.IBT - Increasing Block Tariff
2.HH - Household

Appendix 2

A checklist for further work

Based on the fieldwork conducted in this study we have developed a checklist question which can be used on other operations looking for pro-poor tariff designs. Those questions together with some of our general comments will give you an idea of the current situation in relation to the tariff structure design issues. The comments are based on findings from this study. Appendix 1 presents a general picture of tariffs in some operations.

Appendix 2: Checklist and comments

Checklist questions	Comments based on fieldwork
1 What is the present service coverage in the contract area, by levels of service ?	It is important to know the basic definition of service coverage and the area covered in the contract. In many cases the poor areas may not be included either in the areas to be served or in the basic calculation of service coverage. It is also important to know the overall potential in an area i.e. the people not covered in the initial contract
2 What is the socio-economic profile of the population presently served ?	Information is not available in a form that could be readily used for tariff designs. Availability and reliability are the key issues. Independently verified information provision may be a very useful step forward.
3 What is the consumption profile of the population served, by socio-economic strata, and by levels of service ?	The systems are being evolved and disaggregated consumption information is not easily available. Different approaches and systems are being used even within a country to define a level of service and it makes the comparison among various utilities very difficult. Policy on the issue of levels of service may help.
4 What subsidies are embedded in the present tariff structure (how are they distributed between socio-economic strata, and by levels of service) ?	Hard to identify clearly. The trend seems to be that industrial consumers subsidize the domestic. The subsidies are not targeted appropriately to the poor. The main challenge is to give initial access to service in un-serviced areas. Connection charges are huge barriers to access.
5 What objectives are set in the contract, in terms of extension / improvement of the service (to the poor)?	Very ambiguous and mostly left to good will or public relations motives. There is some recognition that the poor are good customers and can be a significant part of business plans.
6 What is the socio-economic profile of the population presently not served / improperly served ?	Very scanty information and mainly in terms of pilot projects preparation etc. National statistics are either outdated or un-reliable. The simple task of providing information to the operators can really help them to design pro-poor tariffs.
7 What is the demand for service from the population presently not served / improperly served ?	Also look for willingness-to-pay and affordability

Appendix 2: Checklist and comments *(Continued)*

Checklist questions	Comments based on fieldwork
8 What would be, under the present tariff structure, the consequences (in terms of financial sustainability) of extending the service coverage to that population?	Likely to be financially unsustainable unless long term financial mechanisms with firm commitments are introduced. Developing mechanisms to share risk in procurement of services in a way to unlock private sector potentials is still a big challenge.
9 What is the justification of the present tariff structure ? (political and / economic) Who designed it ? When ? On which basis ? Is the tariff study available ?	Even in private sector operated utilities, the tariff structures are inherited. It is not easy to track clearly who actually designed them , on what basis and what were the key assumptions. The whole process of the tariff setting structure is not transparent. There is still a lack of clarity in differentiating between issues related to levels and structure. Structure revisions are not really discussed, the levels are simply adjusted. There are, in different situations, cases for either creating or collapsing block tariffs or even having a universal structure. Options are available but an environment to have a healthy debate on those issues is not.
10 What is the current availability of socio-economic data to carry out a tariff study ?	Some improvements in some operations but overall it is not adequate. (what does this have to do with the question?)
11 What is the operator's perception about the current tariff structure, and its efficiency for extending the provision of services (improving the level of service) to the poor ?	There is a desire for structural changes in order to serve the poor.
12 Are there other general issues regarding the tariff structure in terms of: economic efficiency (such as: deterrent industrial rates); equity (such as: next door neighbour is charged at a different rate !); financial sustainability (such as: revenue declines faster than consumption due to block rates).	All of those are crucial , many have been discussed but no clear actions have come out yet.
13 Are there issues with the regulator regarding the timely application of the price adjustment mechanism, or other threat on the general tariff level for regulatory (or political) reasons ?	Rapport with the clients and regulations is crucial. Policing styles of regulation have not been very effective.
14 What is the population's perception about water tariffs ? What is its awareness of the subject ? Is the utility / public authority communicating on the subject ?	People are willing to pay more for better value of service. They are not likely to pay more for the same level of service.

Appendix 2: Checklist and comments *(Continued)*

Checklist questions	Comments based on fieldwork
15 What is the position of the client/regulator regarding a reform of the tariff structure ? (Who is in charge ? Where is it written ? Is it a national tariff structure ? Is there an explicit procedure for undertaking a reform ? By law ? ...)	National policies in many countries are silent or fragmented. Creation of a national framework can help both public and private operators. Reforms are to be 'a means to an end' and well defined and not an unending exercise with no effects.
16 Have there been proposals from the operator for a reform of the tariff structure ? Is the tariff study available ? Is it supported by donor agencies etc. ?	There are various activities but not a very coherent exercise to tackle this very important issue.
17 Is the relationship between the operator and the client / regulator producing workable solutions?	No, the role , responsibilities and capacity of regulators are not conducive to move effectively on the issues of design of tariff structures.
18 Are different utilities in a different situation ?	Due to general lack of policy framework, different utilities are playing their roles in different contexts. There is a need to provide an encompassing framework to enable utilities to compete in performance.

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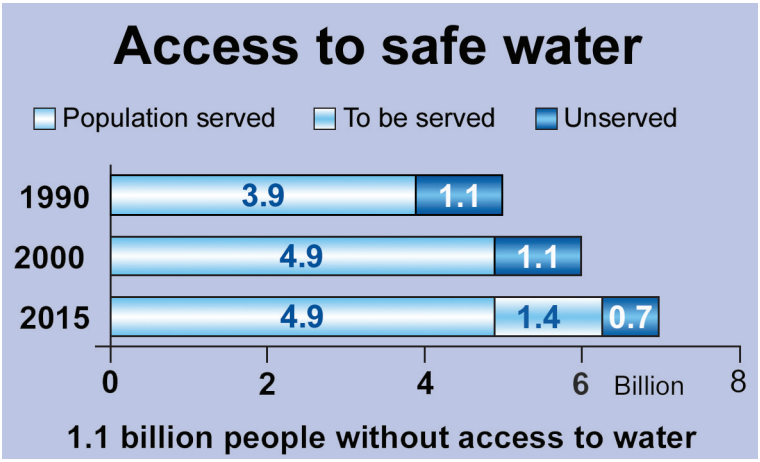

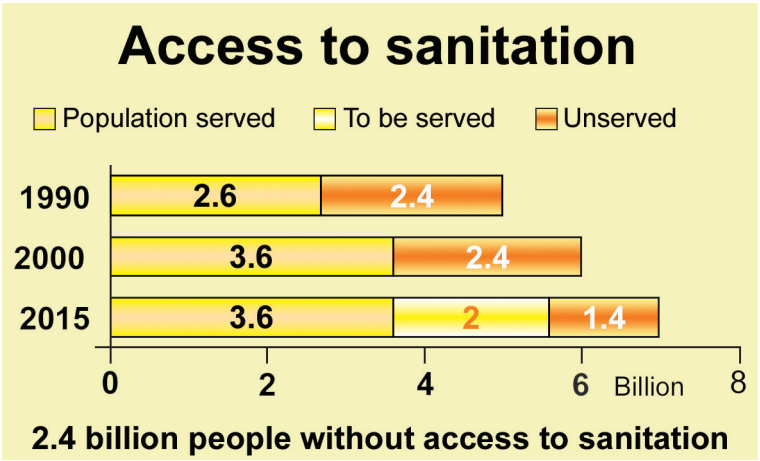

Source: WHO/UNICEF Joint Monitoring Programme (updated 2002).