4. BALANCE OF COSTS AND SERVICE STANDARDS

4.1 Introduction

The prime aim of a public water and waste water entity is the provision of a sufficient, effective and reliable service to its customers. The size and complexity of a scheme will be derived from the chosen level of service to customers.

In this chapter I look at some of the key steps in the iterative process of designing, establishing and maintaining a sustainable, bankable scheme for water and wastewater service provision. This process is followed in a similar manner regardless of whether the scheme is funded by public or private funds.

The process starts with the Grantor defining the level of service that it believes will be politically acceptable to the community. Size, complexity and funding of PPP schemes all revolve around what level of service is chosen and the standards to be met. This directly affects the overall cost of the project. It will be the task of the Grantor (and as appropriate its transaction advisers) to review the technical and financial requirements to provide this level of service and determine the funding requirements from tariff and other sources necessary to reach this level of service (eg expansion of service area to new customers, increase reliability of supply to 24 hours per day, additional sewerage connections etc).

Once the final balance between services, costs and subsidies has been established then the Grantor proceeds to establish the final design, financial approach and the contractual basis of the PPP arrangement.

Figure 10: Balancing Service Standards, Fares & Subsidies

In the long term, there is a need to monitor and control the services to be provided by the Developer, and link this to some form of performance payment mechanism.

I argue that developing a standard set of more customer oriented performance measures, acceptable to a broad range of stakeholders, will allow transaction advisors/policy makers/Grantor to introduce more appropriate performance monitoring systems into the
design of PPP schemes in a more cost effective manner and ultimately lead to more stable long term PPP arrangements. This leads on to the premise that for long term effectiveness and sustainability it is necessary to formalize customer and stakeholder consultation throughout the life of the scheme, by means of contractual arrangements.

4.2 Setting Service Standards and linking to Costs

In this Chapter we are interested in establishing the first step of the project design, where the Grantor sets service standards targets to be achieved, and the standards that will be used to achieve this. Regardless of whether there is public or private funding, the Grantor needs to set out its service goals in terms of coverage (number of people served or to be served) and quantity and quality (physical and bacteriological characteristics of water, reliability, continuity and pressure, customer interface and service, effluent treatment and coverage etc). Clearly, there is a balance in terms of what government wants as regards coverage and quality and what customers are willing (and able to pay). Once initial objectives have been set, the Grantor should estimate the cost of providing the service. However, much confusion still surrounds the definitions of “cost of service” and “cost recovery.” The starting point for determining the level of tariffs is average cost of investment and income required, as well as some issues about the role of tariffs in water PPP schemes.

In relation to coverage and quality specifications, the trend with modern water PPP arrangements is to design them on an output basis, rather than an input basis. Under a traditional approach every aspect of a water scheme was designed in detail, and the contractor had to provide inputs exactly as specified. An ‘Output Based’ approach is well suited to make best use of the ability of the private developer to provide the most economic and practical solutions within defined standards, to meet defined policy objectives, and to attain defined levels of service. The service goals are defined contractually and the Developer has to meet or exceed these goals. There will be a number of key issues that will be set as service goals that have to be met through the life of the PPP arrangement. These have to be defined early in the design process, and chosen to ensure that achieving these levels of service will achieve the long term goals of the PPP arrangement.

A full list of service level goals can cover most aspects of the water scheme, but for successful contractual implementation it is more practical to consider the smallest number of ‘overarching’ levels of service goals that will ensure that the project meets the overall scheme objectives. Further details on this are provided in a later section.

Cost recovery is considered to be at the heart of sustainability of the water and wastewater sector. Regardless of whether a utility is public or private, if it cannot cover its costs the service provided to customers will suffer. Full cost recovery implies that the tariffs are high enough that they can cover the costs of service. In this regard, the cost of service has three commonly accepted elements (adapted from World Bank PPIAF, 2006):

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26 Tariff setting is a highly complex issue. Tariff setting is a careful balance between costs, investment and affordability and social implications. These are interlinked with demand and consumer behaviour. Whilst this whole topic can have a major effect on the sustainability of a PPP arrangement, this research does not delve into tariff setting policy but this information is given to illustrate the importance of this issue for long term sustainability of the water and wastewater sector.

27 An example of this is the divestiture contract in Tallinn, Estonia that specified the outputs in terms of coverage but left the Developer to plan in whatever way it saw was best to achieve that contractual obligation.
• Operating and maintenance expenses - These are the day-to-day expenses involved in providing services and keeping the system functioning. They include labour costs, electricity, materials, repairs to equipment, and the like.

• Depreciation - Depreciation is the reduction in value of system assets over time. This is roughly equivalent to the amount of money needed to replace assets as they wear out.

• Rate of return on investment – Sponsors and lenders will require a return on the debt and the equity which they raise for the project. The return is the amount of money gained or lost on an investment relative to the amount of money invested and includes money earned (a return) on both debt and equity. Typically the cost of debt is the interest lenders charge, whereas the cost of equity is the return to the sponsors of the project stripping out the return committed to debt servicing. The so-called weighted average cost of (debt and equity) capital is usually considered an appropriate measure of the return on capital.

The capital costs of building the infrastructure for a water system are significant. These costs depend on many factors a dominant one of which is the underground asset condition and the validity of the data presented about the condition of the assets, its material, age and other factors. Furthermore, there will be a number of financial factors which should also be considered to include:

• Financing costs which may be impacted by the willingness of the private sector and other lenders as well as the capital markets to provide debt to the project.

• The interest rates and maturities available for such debt,

• The debt service cover ratios which the lenders will require and other associated conditions imposed by the lenders including level of debt and equity of the Developer.

• The availability of bilateral, export credit, government and other funding sources for the project

• Exchange rates between the local currency in which debt will be made available including the cost of any currency exchange.

• Land costs

• Labour costs

• The tax and accounting regime which will influence issues such as the level of asset depreciation allowable, tax treatment on financing and interest payments etc

Full recovery of these costs will only be achievable if the associated level of the tariff proves affordable to the customers (Ehrhardt, 2003).

In many developing countries, the low level of the domestic economy makes it likely that only a portion of the tariff allowing full cost recovery will be affordable by many sections of the community. Although the international lending institutions (eg World Bank, Inter American

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28 Under the current financial conditions, we have seen a retraction of major lenders in infrastructure. This liquidity crisis has led to major investment in infrastructure (including water and wastewater) being delayed. International Monetary Fund, internal briefing note to World Bank staff, 6th April, 2009.

29 It should be noted that in some jurisdictions there are limitations imposed on the level of foreign currency that may be used for a project or capped imposed on the amount of profit that may be repatriated.
Development Bank) would ideally aim for full cost recovery, there is an appreciation that in most cases in developing countries this would result in tariff levels not currently affordable.

Frequently the aim is at the minimum for new schemes to operate with at least a tariff that will recover Operating and Maintenance costs. As the scheme is established, and the customers begin to benefit from the improved levels of service, then it is often planned to increase the tariffs further, often in a gradually increasing manner with time, until the maximum economically affordable tariff level is reached.

### 4.3 Determining Tariffs and Subsidy Requirements

Having estimated the cost of providing the required level of water service, the next step is to check how much of this amount should be recovered through tariff income, and how the balance of capital and operating costs need to be recovered through the funding arrangement for the water project.

Figure 11: Balancing Income with Cost of Service

“To be viable: Fares + Subsidies = Total Cost of Service”

As mentioned earlier, in setting the income that the water system needs to earn, the Grantor needs to consider not just the full cost of service as described previously, but also the annual cash needs of the Developer, and the financial ratios required by lenders. Some of possible implications are described in the section on funding.

At the same time when setting tariffs the following should be considered:

- **Willingness to pay:** Given the social nature of the water and wastewater services and the fact that the main revenue stream can only come from its customers,\(^30\) willingness to pay is crucial in assessing the overall sustainability of the services to be provided. Research suggests that willingness to pay surveys show that most consumers (especially unconnected consumers) are willing to pay substantial amounts for better water services (World Bank PPIAF, 2006). An assessment of willingness to pay for various levels of service, together with customer demand forecasts will be useful.

\(^30\) For the purposes of this research I have looked at the point of view of a utility focusing solely on water and wastewater services and therefore I do not consider any subsidiary income streams from outside this core business.
Box 3: Applications of OBA – Subsidy Design Mechanisms

**One-off subsidies** are the most common application of OBA approaches and usually involve capital subsidies for access to a given service. An example is when a large portion of the subsidy is paid after the targeted beneficiaries are connected to a network and connections are verified. Given that in OBA approaches the emphasis is on service delivery rather than on physical connections, even in the case of one-off subsidies a portion of the subsidy may be withheld and paid only after verification of a certain number of months of satisfactory service delivery (hence a mixture of “outputs” and “intermediate outcomes” against which one-off subsidies are disbursed to provide a measure of improved access).

**Transitional subsidies** can be used to support tariff reforms, where a subsidy is used to fill the gap between what the user is deemed able and/or willing to pay and the cost-recovery level (eg, long-run marginal cost) of the tariff. The subsidy is transitioned out after a specified period of time (eg, months or years) as the user contribution increases (and possibly as tariff levels required for cost recovery decrease with efficiency gains). In these cases, the output against which the subsidy is paid is the service delivered and billed by the provider. The review identified only a handful of transitional OBA schemes and very few of those are still in place, often because of differences in actual demand and willingness-to-pay as compared to estimates made ex ante.

**Ongoing subsidies** may be required in cases where there is a continuous gap between affordability and cost recovery – including for consumption costs. As in the case of transitional schemes, ongoing subsidies should be paid out against pre-determined targeted outputs in order to be considered OBA. On-going schemes are largely used in the roads and health sectors, although several ongoing OBA schemes have been identified for the utility sectors outside of the WBG.

*Source: Global Partnership on Output Based Aid, 2009*

Decisions on whether to raise tariffs or decisions on levels of service provision have a direct impact on the operational performance of a utility (regardless of whether it is a publicly run utility or whether it is a private undertaking managed by a Developer under a PPP scheme) and its customers (Estache and Rossi, 2002).

Whilst this research does not focus on the issues of whether it is justifiable to subsidise in the context of PPP schemes, subsidies may play an important role. Having considered the cost of service, willingness to pay, social acceptability, externalities, and subsidy options, the government will face a choice of what tariff level should be applied. In some instances the Grantor may decide to set tariffs below costs and provide a subsidy to make up the difference. Making these decisions may involve consultation with customers and other stakeholders. It may be necessary to develop a range of options, and iterate toward a solution, until finally an

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31 The 1903 water riots in Port of Spain, Trinidad and Tobago resulted from an ordinance that increased the cost of water. A number of public meetings had been held to protest the increase, culminating in a demonstration on March 23 in front of the main government building (Brunswick Square) smashing windows and causing members of the legislature to hide under tables for protection. The protesters set the lower floor on fire, at which time police opened fire on the crowd, killing thirteen people, and injuring forty-two others. Another highly publicised event occurred in the last decade in Cochabamba, Bolivia, referred to in an earlier chapter.
acceptable trade-off between tariffs and level of is reached. It must be noted that there is a
trend to disburse subsidies on an output basis. This can be a particularly useful technique to
augment the bankability of a PPP scheme. See box 4 for further details.

4.4 Performance Indicators

Monitoring and enforcing performance is at the heart of successful implementation of any
PPP agreement. In this section I look at this subject in some detail, since this very important
issue has to be clearly and practically dealt with in the contractual arrangements.

Typically Developers carry out several types of reporting on their performance. These include
internal reporting on performance for managers and others in the company, financial
reporting for owners (shareholders) and creditors, as well as the reporting on their
performance for regulatory purposes established in the obligations of the PPP agreement.

As the functions of provision of water and wastewater services are being delegated to the
Developer through a contractual structure – the PPP agreement – it is imperative that systems
are in place to monitor and enforce performance. For example, according to Dinar (2000) it
will be important that the Grantor is able to monitor whether the Developer is meeting its
obligations with respect to:

- Obligations related to service coverage targets (if any) in terms of quantity and quality
- Provision of water to required standards such as pressure, continuity of supply etc
  (and for wastewater it may include specific treatments standards\(^{32}\))
- Upkeep, upgrade and rehabilitation of the assets (both above and underground)
- Adequate reporting by the Developer of its activities

However, these more traditional metrics of service performance monitoring do not necessarily
measure the customer’s experience with the Developer\(^{33}\). My premise is that for performance
monitoring, enforcement and reporting to be effective, it requires access to performance
indicators that are most relevant to the customer’s experience with the Developer, namely,
whether the service provided is reasonable considering the tariffs that customers are asked to
pay. If metrics related to contract obligations as well as specific indicators related to the
customer’s experience in receiving a service are brought together, then PPP agreements and
their resulting obligations are more likely to be understood by the public. Ultimately a better
informed customer means that expectations in terms of service quality and reliability can be
managed leading to an overall more sustainable PPP scheme\(^{34}\).

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\(^{32}\) These standards typically include specific metrics such as level of suspended solids (SS), Biological Oxygen
Demand (BOD) etc.

\(^{33}\) Customer-oriented performance reporting differs from these points, with the focus not on detailed internal or
financial issues but on matters of direct interest to the end user. Such reporting will also provide important
insights to others, such as consumer-advocacy groups, chambers of commerce, other nonprofits, regulators, and
governments.

\(^{34}\) Interestingly, experience in PPP schemes throughout the world shows that although the provision of water and
wastewater services are a basic service, the interface with customers is often overlooked. Although an obvious
statement, my research shows that in many cases the introduction of the private sector into the provision of
water and wastewater services has been used by governments to defray political attention and sometimes
unpopular decisions. Examples abound (for example Trinidad and Tobago, Dar es Salaam, Tanzania) of failed
PPP schemes where the public was ill informed about the scope of the respective PPP agreement and customer’s
expectation were not managed appropriately. Developers need to ensure that they interface with the public
An important question to answer is precisely what is effective consumer reporting? Cook and Stevens (2004) perceive it as: (i) when customers are knowledgeable about the quality of service they are receiving and the value for money, and; (ii) the collection of information that leads to improvements in service levels; (iii) an increase in transparency that increases public knowledge on the balance facing the utility over service, tariffs and investments.

Effective consumer-oriented reporting relies on a good set of easily-understood performance indicators. These will assist the Developer, monitoring units and governments in assessing the performance being provided and if made available in an easily-understood format, can assist the public in evaluating performance levels as well. Involving the public at this level can lead to improved decision-making, service delivery and accountability.


- Coverage of households or other potential customer bases
- Quantity of water provided or consumed
- Water quality
- Water pressure and reliability of pressure
- Customer service response times
- Customer satisfaction with different aspects of service, and
- Affordability

Basic wastewater performance indicators include:

- Coverage of households and other potential customer bases
- Service quality and reliability (frequency of sewage backups and overflows or frequency of collection of sewage from holding tanks)
- Customer service response times
- Affordability, and
- Level of treatment and quality of outflows of treatment plants to the environment (which is not a customer-oriented indicator, but one of more general consumer interest for water resource management)

Each of the above mentioned indicators can serve to inform decisions on service provision, policy decisions and customer decisions. My recommended approach is one that seeks to synchronise data from the Developer and customer surveys in order to generate a more meaningful perspective on the operation and management of the utility. At the same time, the advantage of this type of monitoring scheme within a contractual context is that it can be adjusted over time along with operational and data quality improvements, and as such may be used to:

- Progressively tighten targets;
- Increase the number and sophistication of indicators at each review period;
- Progressively replace some of the surrogate indicators, as better data becomes available.
The benefits of this type of consumer based performance indicators can be summarised from the perspective of both the Consumer/Customer\(^{35}\) and the Developer:

**For Consumers:** Information is power and information on actual service level provision can provide a powerful tool for customers to demand service improvements should they be required. Consumers will have three options under PPP arrangements to take action to obtain service improvements: (1) they can approach the utility, (2) file a complaint with the regulator (if one exists) or (3) approach their political representative with their issue. If a partnership arrangement is constructed between consumers and the utility, the information will inform discussions over service and tariff changes.

Critical decisions relating to the management of water and wastewater service provision are often based on inaccurate and insufficient data as discussed in Chapter 12. NGOs and consumer groups are often suspicious of the PPP process, and wary of the “benefits” that will flow from such an arrangement. Insufficient communication between the Developers and its customers can breed misunderstandings which in the past, have led to the collapse of PPP arrangements\(^{36,37}\). It is important therefore that all stakeholders of a PPP process\(^{38}\), and indeed all consumers, have access to information about the performance of Developer responsible for their service provision.

**For Utility Managers** the greater accountability provided by the improved reporting mechanisms gives greater incentives for utilities to improve service performance, keep consumers happy and mitigates any pressure that the government may place on them in the event of inadequate service provision.

Some of the main barriers to improved public reporting may include:

- Secrecy of agreements in some cases, particularly in older PPP agreements, which are not in the public domain and prevent information on performance reporting and performance target achievements from being made public\(^{39}\)
- Lack of specification of the requirements for information and processes related to public reporting in the PPP agreement itself
- Lack of definition of the role of monitoring units in the process of public reporting

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35 The use of the word customer and consumer are used interchangeably. However it is noted that typically the distinction is made as customers (unlike consumer) have rights including right to safe water, right to be informed and the right to be heard amongst others.

36 One such example is what happened in Cochabamba, Bolivia, after a concession type contract was signed where there were a number of civil disturbances that ultimately lead to the early termination of the contract. Although not a single factor is attributable to this early termination, (for example there was an obligation by the Grantor for the developer to build an expensive dam), the PPP agreement allowed for a 35 percent increase in tariffs at the start of the contract and a 20 percent increase once the new dam became operational. Upon review of the causes of failure, lack of communication between stakeholders and no adequate mechanism for addressing concerns of these groups played a key role in the early termination.

37 See Bechtel 2002 Company statement on “Cochabamba and the Aguas del Tunari Consortium.”

38 Stakeholders of a PPP process include not only the customers, potential customers, workers, private Developers and financiers and taxpayers.

39 An interesting example of this is the PPP agreement in Trinidad and Tobago which was not publically available despite it being a management contract. PPP agreements in Guayaquil, Ecuador, Mexico City, Mexico, Bucharest, Czech Republic are also not publically available. The PPP agreement of Mendoza, Argentina (at the time in which it was won by a consortium of Saur and the failed US energy giant Enron) was not publicly available in Argentina. However because Enron was a NY listed company, there was a public disclosure obligation imposed by the Securities and Exchange Commission to make public such contractual documentation.
- Lack of Grantor interest in accountability and transparency in some countries (although in some instances this can be compensated by the interests of the NGO community\textsuperscript{40} and the multi-lateral donors)

- Resistance/lack of incentive for some Developers to be transparent, since not all Developers feel that provision of information is in their best interest\textsuperscript{41}

- Lack of a partnership approach in most cases to the relationship between Developers, customers and owners or regulators.

Accordingly, it will be important to develop strategies within the PPP agreement that allow improved monitoring of performance. Some of the research shows that in some instances Developers have actively sought improved disclosure such as was the case in Buenos Aires Argentina\textsuperscript{42} leading up to the suggests that NGOs can be co-opted into effective monitoring roles. Cases in Argentina, Colombia, Philippines, Zambia and Senegal\textsuperscript{43}, demonstrate that NGOs and Community Organizations can contribute to constructive dialogue for improved performance when given the task of monitoring tariffs and services and representing consumers and customers. Integration of NGOs to oversight committees has also taken place and can also be an effective method of introducing greater consumer-driven accountability.

A key recommendation is to ensure as great a level of transparency and information transfer as possible. Monitoring units that are housed in regulatory agencies tend to have a greater inclination to keeping performance data confidential than those that are housed outside of government bodies. It is therefore recommended that monitoring units are required to use multiple channels to report performance standards to the public and develop mechanisms to obtain customer surveys on service levels and areas of improvement. Monitoring units are

\textsuperscript{40} NGOs, community-based organizations, and other civil society organizations should not be treated as a single group. They represent different stakeholders and different interests, and need to be engaged with a clear understanding of whom each organization represents and what its interests are. Some NGOs and community-based organizations will be effective conduits for dialogue with consumers.

\textsuperscript{41} Some of the big multinational water companies have felt that it is in their best interest not to make PPP agreements public as this allows ‘greater flexibility’ in terms of re-negotiations. Interestingly, at the time this research was done, accessing PPP agreements was difficult and in some cases special permission had to be sought from the existing Developer to use this document. In other cases, such as the case of Guayaquil, Ecuador, where the author was engaged as a mediator, specific permission had to be sought.

\textsuperscript{42} This occurred during the preparation of the Second Five-Year Plan for the concession in 2000, and took more than a year to complete. The Concessionaire put together a series of presentations on service quality aimed at a variety of stakeholder groups. The information in these presentations was checked with the Regulator’s office for validity before they were made. Some of these presentations were made as part of a public hearing process, which was an extra-contract activity agreed with the Regulator and some were for municipalities and other stakeholder groups. This consultation process was intended by both the Regulator and Concessionaire to get “buy-in” from the different stakeholders as the plans were adjusted to their needs. At the end of the process, the different municipalities gave their approval to the revised plan. This approval was not a legal requirement, but was critical to the political process.

\textsuperscript{43} The research shows that NGOs and Consumer Organizations in particular, are playing an important and increasing role in water sector monitoring in many developing countries. However, there is a large variation in the approaches that are taken by NGOs in different countries, some are confrontational and do not contribute to a constructive dialogue for improving performance or getting more value for consumers. Other approaches can be very constructive and effective. NGOs and COs are often called upon to represent consumers on regulatory boards and other bodies. Examples of this are found in Zambia, where ZACA (a CO) was invited to be a member of the National Water Supply and Sanitation Council, in Senegal, where ADEETelS (a CO) has both a seat on the board of SONES the state asset-holding company in the water sector and has been appointed a member of the management committee for the next phase of water sector reform, in Metropolitan Manila, Philippines where CONSUMERNET is on the Board of Directors of the regulatory authority (MWSS).
never completely independent and should be viewed as useful watchdog, rather than a replacement for the Operator/Developer completing its contractually obligated tasks.

Various studies (Gentry et al, 1999 and Nichols, 2004) suggest that consumer-oriented reporting utilize multiple channels for public reporting, using the following components:

- Using media outlets such as the local press or radio networks
- Produce annual reports available on the internet
- Conduct customer surveys that request information on levels of service and satisfaction levels
- Conduct regular dialogue roundtables with NGOs or Committees
- Undertake road-shows to present performance information and host consumer feedback sessions.

### 4.5 Summary and Conclusions

The PPP schemes considered in the Water and Waste Water sector have the service level provision to their customers as their prime focus.

An iterative process is used to establish effective scheme service standards, sizing, costs, funding and financing. If levels of service are taken as the prime focus of the PPP schemes, then this iterative process defines and sizes an affordable scheme for which effective operational, financial and contractual arrangements have to be developed.

Determination of the affordable tariff levels is key to ensure customers ability to pay for the services, and hence the financial sustainability of the services. Generally some form of subsidy is necessary for schemes in developing countries, as affordable tariff levels are not high enough to give full cost recovery. The details of this, any subsidy arrangements, any progressive program for change in tariff levels as levels of service improve, need to be clearly defined in the contractual arrangements.

There is a need to monitor and control performance parameters under the PPP arrangement. A variety of performance measures can be defined for many activities of a utility. However, I propose that measures should be output based and directly related to a customer focused approach.

There is a need to ensure that there is full stakeholder consultation at all stages of development and operation. Case history shows the positive effect of stakeholder involvement in design, development and implementation of PPP schemes (and also the potential negative effects when they are not involved). This leads on to the premise that for long term effectiveness and sustainability it is necessary to formalize customer and stakeholder consultation throughout the life of the scheme. I recommend that the contract terms specifically include provision for stakeholder consultation to be established by the Grantor, to reflect the importance of this issue.