

**ECONOMIC REGULATION OF WATER
SERVICES IN SOUTH AFRICA**

Palmer Development Group

WRC Report No. 1383/1/04



Water Research Commission



ECONOMIC REGULATION OF WATER SERVICES IN SOUTH AFRICA

**Report to the
WATER RESEARCH COMMISSION**

by

Palmer Development Group

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PREFACE

This report forms part of the Water Research Commission project titled: "Regulation of water services: models for South African municipalities." (K5/1383/3)

The project had two primary objectives:

1. To review relevant international experience related to the *economic* regulation of water services with a view to highlighting best practices which may be appropriate for South African municipalities.
2. To identify and develop appropriate and practical models and methods of economic regulation which are suited to the South African municipal water services context, and which cover the spectrum of ownership and contracting arrangements that currently exist and/or are likely to exist in the future.

A secondary objective of the project is to make economic regulation discourse more generally accessible to a broader audience in South Africa.

The aim of Phase 1 is to identify appropriate and practical models and methods of economic regulation. Phase 2 of the project will develop guidelines for the application of these models if appropriate.

The outputs of this project are as follows:

- Report 1: Economic Regulation of Water Services in South Africa (WRC 1383/1/04)
 - Annexure A: Economic regulation of water services in Africa – a review.
 - Annexure B: Economic regulation of water services in Australia – a review.
 - Annexure C: Economic regulation of water service in Chile – a case study.
 - Annexure D: Economic regulation of water service in Johannesburg – a case study.
- Report 2: Draft guidelines for economic regulation of water services in South Africa (WRC TT 229/04).
 - Annexure A: Methods and tools for the economic regulation of water services – a review.

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EXECUTIVE SUMMARY

1. Introduction

Economic regulation may be defined as the protection of the public interest and consumers through the promotion of effective, efficiency, financially viable and sustainable water services providers, by

- ensuring adequate and efficient investments in infrastructure (type, amount, timing);
- ensuring efficient operations and operating decisions; and
- appropriate pricing, primarily in relation to the promotion of efficiency in the above two senses, but also an understanding of its distributive impacts and a balancing of economic, social and environmental goals, and an evaluation and regulation of price levels.

The project sought to answer the following key research questions:

1. How will a “regulator” (regulatory authority) determine if the average price level is appropriate?
2. How will a regulator determine what level of investment is appropriate?
3. How does the institutional/governance model affect the above two questions?

The scope of the study extended to both water and sanitation, to both bulk and retail water and sanitation, including on-site sanitation services and pit-emptying, water services for households, commerce, institutions and industry but not for agricultural use, focus on method (but take into account the policy and institutional context), focus on economic regulation of water services in the municipal context, focus on pricing and investments and not on price structures.

2. Outputs

The study produced the following outputs: an initial discussion paper, a Phase 1 draft report (findings of research), four working papers (details of research on specific topics), a draft guideline (practical application of economic regulation), and a final report.¹ Details of these outputs are given in the preface.

¹ A capacity building report was also produced but does not form part of the “content” outputs.

3. Recommendations arising from findings

3.1 Building blocks for improved economic regulation

National capacity needs to be strengthened to support the development of good contracts between water services authorities and water services providers (where these are external). There needs to be greater transparency in these contracts. A much greater understanding needs to be developed with respect to what constitutes best contracting practice (see capacity above). Greater clarity is needed on the enforcement of (especially public-public) contracts.

Proper financial ring-fencing of water services, including proper accounting for the assets is a *necessary pre-requisite* for economic regulation of water services in South Africa.

Establishing an appropriate rate of return on water services assets when used for "economic purposes" is a good starting point for economic regulation in South Africa.

In order to implement rate of return regulation, it is necessary to separate out the community service or social obligations (CSO) of the water services provider. These social obligations are any services which are supplied at less than full economic cost, or services which are supplied for the benefit of the broader community (for example, municipal parks). The costs of the CSO should come from the national tax payer (in the case of universal service obligations determined nationally) and from the local tax payer (in the case of local community service obligations such as municipal parks).

A standard method for valuing water services assets in South Africa should be developed. A standard method for depreciation should be adopted and standard periods used for types of assets appropriately classified. This could be part of GAMAP.

The costs of externalities (typically environmental externalities) should be internalised into the costs of the service. These should only be included in allowed costs where actual payments are made (that is, where they *have* been internalised).

A better understanding of how to measure operating efficiencies is needed. This also entails developing measures for quality of service provided.

Ways to strengthen consumer voice need to be found. The requirement of customer or consumer charters is an important step forward.

3.2 Policy, legislative and institutional reform

Wherever external contracts are entered into, these should be on a competitive basis. There are no good grounds for excluding public agencies from competitive tendering requirements.

As a first step towards improving economic regulation of water services in South Africa, the economic regulation of water boards could be considerably improved and strengthened. Water Board regulation should be moved to a rate of return, with clear ring-fencing of any community service obligations and retail operations.

It is not clear that adequate or appropriate incentives exist at present for institutional and regulatory reform in the water services sector.

The case for vertical integration of water services providers (even on a selective basis) in South Africa needs to be examined more thoroughly.

3.3 A role for guidelines

There is a role for guidelines for water services authorities on the following topics related to economic regulation:

1. Give practical guidance on how to go about ring-fencing water services.
2. Give guidance on the establishment of an appropriate asset register for water services, including a standard method for valuing and depreciating assets.
3. Give guidance on how to separate social and community services and obligations from "economic services", and to account for subsidies and grants.
4. Present a standard reporting format.
5. Show how prices should be structured and calculated.
6. Describe a process for reviewing investment decisions and reporting.
7. Guideline for practical application of economic regulation.

4. Guideline – practical application of economic regulation

As part of this project, a *draft* guideline (for discussion purposes only) on the practical application of economic regulation to water services was developed (see preface). This guideline sets out a detailed methodology for the application of rate of return regulation to water services and also briefly covers incentive-based regulation and the ideal company model method of regulation. This is a primary output of the project and should be read as a stand-alone document. For this reason, no summary of the guideline is presented here.

5. Implementing economic regulation in South Africa

5.1 Towards an economic regulation strategy

Before economic regulation can be effectively implemented in South Africa, it will be necessary to demonstrate more conclusively the benefits that can arise from the effective application of formal economic regulation in the South African context. A

specific study aimed at quantifying the financial and economic benefits accruing from economic regulation of water should be undertaken.

The experience of economic regulation in the electricity industry (as well as the experience of the contracts management unit) suggests that it will take a number of years to effectively implement a formal economic regulatory framework in South Africa. Nevertheless, it is important to get started. Progress will be incremental and will need to take into account capacity constraints. However, the real learning and capacity development will occur through the process of implementing economic regulation and the associated institutional reforms.

The application of economic regulation should be strategic. Implementation should focus on these areas where the most gains can be made for a given level of effort (both in terms of learning and in terms of actual economic gains from the application of economic regulation). The most obvious starting points for the application of economic regulation are Johannesburg Water (the only truly ring-fence municipal water services provider)² and Rand Water and Umgeni (the two most economically significant water boards).

The learning can inform the evolution of the economic regulation strategy and the economic gains demonstrated can help to build a stronger case for the wider application of economic regulation.

Economic regulation must also ensure that compliance with service standards is achieved cost-effectively. Service standards include the reliable provision of service; quality of supply and service; customer satisfaction and resolution of complaints and disputes. There is a direct relationship between the quality of standards imposed and the cost of meeting these standards.

When understanding economic regulation it is important that this be seen not as a parallel process to other areas of regulation (standards, environmental and so forth) but as an integral part of deciding on those standards. A better understanding between the different areas of "regulation" needs to be developed and ROR regulation, with a focus on allowable and required costs can foster this.

In the case of rate of return regulation there is little incentive to cheat on standards because all costs incurred by the utility for the provision of reliable services, quality supply and customer satisfaction, are allowed in the ROR methodology.

In the case of incentive-based regulation, utilities may have an incentive to cut costs at the expense of meeting service standards. The regulator will have to ensure that quality assurance programmes are undertaken by the regulated entities.

² Excluding private water service providers providing services in terms of concessions or leases.

Rate of return regulation is the first stage of incentive-based regulation (IBR). It is therefore relatively academic at this stage which methodology is used. IBR has a higher incentive power for efficiency but is also more complex to implement and carries greater risk in the context of market uncertainties. Because of the proposed restructuring of the water services industry (as set out in the national Strategic Framework for Water Services) and the consequent uncertainty within the South African water industry, it is recommended that revenue and price reviews be done on an annual basis rather than in terms of a three to five year cycle. The annual application of economic regulation will also increase learning in the sector and help in the development of capacity. For these reasons, it is recommended that rate of return regulation be implemented initially with a view to evolving towards incentive based regulation. See Guideline for more detailed recommendations.

Where professional skills are scarce the opportunity cost of scarce human capital devoted to regulation is significant and should also be considered when developing an institutional reform and regulation strategy.

Ultimately it is probable that effective economic regulation will only be achieved once an independent regulator with adequate capacity has been created. This is a position advocated by the South African Utility Regulator's Association (SAURA). However, it is not likely that an independent regulator for water services will be established in the short term. In this context, there are some intermediate steps that can be adopted with a future transition to independent regulation in mind.

5.2 Complementary initiatives

Probably the most pressing economic issue facing the water services sector is that inadequate resources are being made available for rehabilitation and maintenance of systems. The most important means of addressing this problem is the institutional reform of the sector with the view to professionalising the water services industry, especially for the major urban centres. The national Strategic Framework for Water Services sets out a policy framework for this reform which should be pursued as a matter of priority.

The decentralization to local government of decision-making with respect to the allocation of capital and operating subsidies poses particular challenges to the water services sector. It is important, from an economic regulatory point of view, to be assured that capital and operating subsidies are being allocated and used efficiently.

The best way of ensuring this is to insist on the proper ring-fencing of water services provision. In this way, formal economic regulation can be conducted and the efficiency of resource use in general, and subsidy use in particular, can be assessed. However, in many cases (particularly for the smaller rural municipalities), it will not be practical to ring-fence water services in this way. Methods to ensure efficient subsidy spending in this context need to be developed.

Improving contract regulation is an important complementary initiative to the development and implementation of this guideline. The most immediate priority is to review the Water Services Act and Section 19 regulation in light of the cabinet approved national Strategic Framework for Water Services. In addition to this, additional capacity in the national water services regulator (DWAF) is needed to review all contracts before approval and to assist with contractual amendments and disputes. The economic principles set out in this guideline can be used to inform the regulation of investments and tariffs within contracts.

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Annexure A: Economic regulation of water services in Africa - a review

Annexure B: Economic regulation of water services in Australia - a review

Annexure C: Economic regulation of water in Chile - a case study

Annexure D: Economic regulation of water in Johannesburg - a case study

1. Introduction

The primary purpose of this report is to summarise the outcomes of this research project on economic regulation. The scope of regulation and how economic regulation relates to other areas of regulation is set out in Section 2.

The project sought to answer the following key research questions:

How will a “regulator”³ determine if the average price level is appropriate?

Assessing tariff levels is a major component of economic regulation, and would require information with respect to the (efficient) costs of providing the service and determining an appropriate relationship between the costs of the service provided and the average price of the service.

How will a “regulator” determine what level of investment is appropriate?

The costs of service provision are dependant to a large degree on the nature and extent of the investments made in infrastructure. An appropriate task of the regulator is to ensure that investment made by the water services provider are appropriate. The incentives influencing the investment decision are dependent on the institutional context, governance structure and universal service obligations. In a context where the universal provision of basic services is a social and political priority, the regulator must ensure that an appropriate balance is struck between investments in infrastructure to meet basic needs and those required to support economic development. This research project will assist in providing practical guidance to regulators to assist them promoting efficient investments to achieve an appropriate balance.

How does the institutional/governance model affect the above two questions?

The institutional model and governance structure will affect the incentives of agents making the above choices. Three basic institutional/governance models are likely to be most common in South Africa:

- Water services are provided by the municipality itself, that is, the municipality is both the authority (regulator) and the provider (operator).
- Water services are provided by a public utility with ownership-control by the municipality (that is, the municipality is both the regulator and the shareholder, but not the operator).

³ That is, the government body, agency or person that undertakes the regulatory function. The term “regulator” is synonymous with the term “regulatory authority”. The term regulator is used widely internationally and makes for easier reading.

- Water services are provided by another public or private agency in terms of a contract (for example, a water board, another municipality, a public entity owned by another municipality, a private company, a community-based organisation) in terms of a management contract, lease or concession where procurement is either on a sole-source or competitive basis.

These models need to be considered with respect to the capacity and ability of the water services authority to regulate, and the structure of the business (for example degree of horizontal and vertical integration).

1.1 Scope

The scope of the study extended to both water and sanitation, to both bulk and retail water and sanitation, including on-site sanitation services and pit-emptying, water services for households, commerce, institutions and industry but not for agricultural use, focus on method (but take into account the policy and institutional context), focus on economic regulation of water services in the municipal context, focus on pricing and investments and not on price structures.

1.2 Outline

The report is structured as follows:

- Understanding regulation
- The South African framework
- Gaps in the current regulatory framework
- Learning from the literature
- Conclusions
- Implementing economic regulation in South Africa.

The report is supported by research contained in four Annexures which are listed in the preface.

This report is also accompanied by a draft guideline for the practical application of economic regulation in South Africa (see Preface).

2. Understanding regulation

2.1 A conceptual framework for regulating water services

In terms of the National Water Policy White Paper (1997) and the National Water Act, the objectives of regulating water services in South Africa are threefold:

Ensuring equity and public benefit: This could be called "social" or "public benefit" regulation as it is concerned with universal access to basic services, the more equitable distribution of resources and safe-guarding public health. Two important

aspects of this regulation are service coverage targets and minimum standards of service.

Ensuring sustainability in terms of financial sustainability, institutional sustainability and environmental sustainability. Financial sustainability is promoted through pricing and subsidy policies and by ensuring adequate access to capital finance and operating resources. These need to be controlled through financial regulation. Environmental sustainability is promoted through environmental regulation (water demand management and pollution/effluent management and control, environmental impact assessment requirements, strategic environmental assessments etc). Institutional sustainability is promoted by ensuring organisations are fit-for-purpose, effectively managed, adequately resourced and operate within a sound incentive environment.

Promoting efficiency and effectiveness. The primary objective of economic regulation is to ensure that resources are used efficiently, that the application of resources is effective (achieves the desired goal) and that wastage is minimised. The importance of economic and financial regulation in the context of the monopoly provision of water services is highlighted below.

Internationally, governments typically apply a range of instruments to regulate public service industries, particularly where they involve natural monopolies. These include:

Technical regulation: to influence service outcomes such as the quality of water supplied to consumers.

Environmental regulation: to influence environmental outcomes such as the protection and conservation of ecosystems. Environmental regulation is concerned with environmental impacts of water supply schemes, and wastewater and sanitation systems.

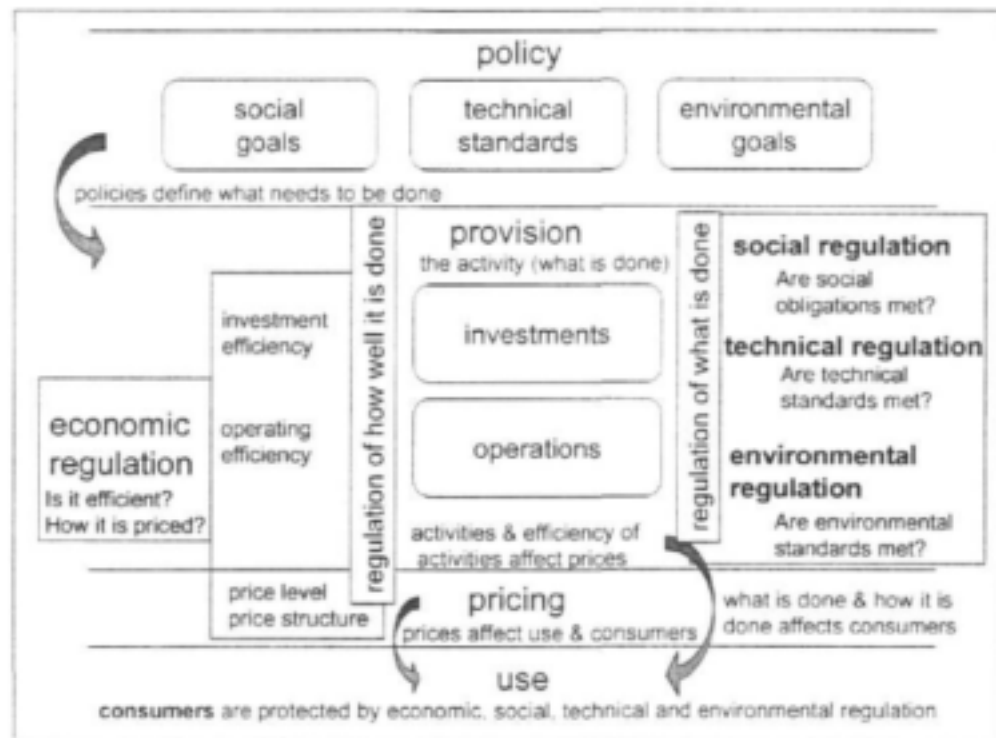
Social or Public benefit regulation: to influence social outcomes such as the provision of basic services to households.

Economic regulation: to influence economic outcomes such as costs and efficiency of service provision (both investments and operations), prices, financial sustainability, the level of return on assets and the extent monopoly profits.

In the national Strategic Framework for Water Services, technical and social benefit regulation are considered together and called "norms and standards" regulation.

There are obviously strong links between social, technical, environmental and economic regulation in that the nature of the social, technical and environmental regulation will have an important influence on investment requirements and operating costs in the water sector. *All four spheres of regulation must therefore form part of an integrated regulatory framework.* Such a framework is illustrated in Figure 1.

Figure 1: Conceptual framework for regulation



2.2 What is economic regulation?

Economic regulation may be defined as the protection of the public interest and consumers through the promotion of effective, efficiency, financially viable and sustainable water services providers, by

- ensuring adequate and efficient investments in infrastructure (type, amount, timing),
- ensuring efficient operations and operating decisions, and
- appropriate pricing, primarily in relation to the promotion of efficiency in the above two senses, but also an understanding of its distributive impacts and a balancing of economic, social and environmental goals, and an evaluation and regulation of price levels.

For further discussion of economic regulation, see for example, Klein (1996).

2.3 Why focus on economic regulation?

2.3.1 Economic theory

The two fundamental arguments for *economic* regulation in the water sector based on economic theory are:

- **Market failure:** The water services industry (bulk water supply and distribution) are natural monopolies in most circumstances. Natural

monopolies should be regulated in order to protect the public interest because monopoly enterprises generally have few incentives to invest or operate efficiently and because customers are captive to the monopoly provider and need protection from monopolistic pricing.

- **Public interest:** Water is a public good with benefits and costs that extend beyond the direct provision of services to individuals. Government must ensure that the interests of the public are protected through the regulation of investment and pricing decisions (two key aspects of economic regulation).

There is an extensive literature on this. See, for example, Klein (1996) and Chang (1997).

2.3.2 International practice and private investment

International best practice (see, for example, Annexures B and C) demonstrates the need for, and benefits of, regulation of water services. Furthermore, private investment is dependent on good economic regulation.

2.3.3 The need to regulate water services in South Africa

In South Africa, the water services sector is dominated by public sector monopolies which are owned and operated either by national government (in the case of Water Boards) or by municipalities (most retail operations).

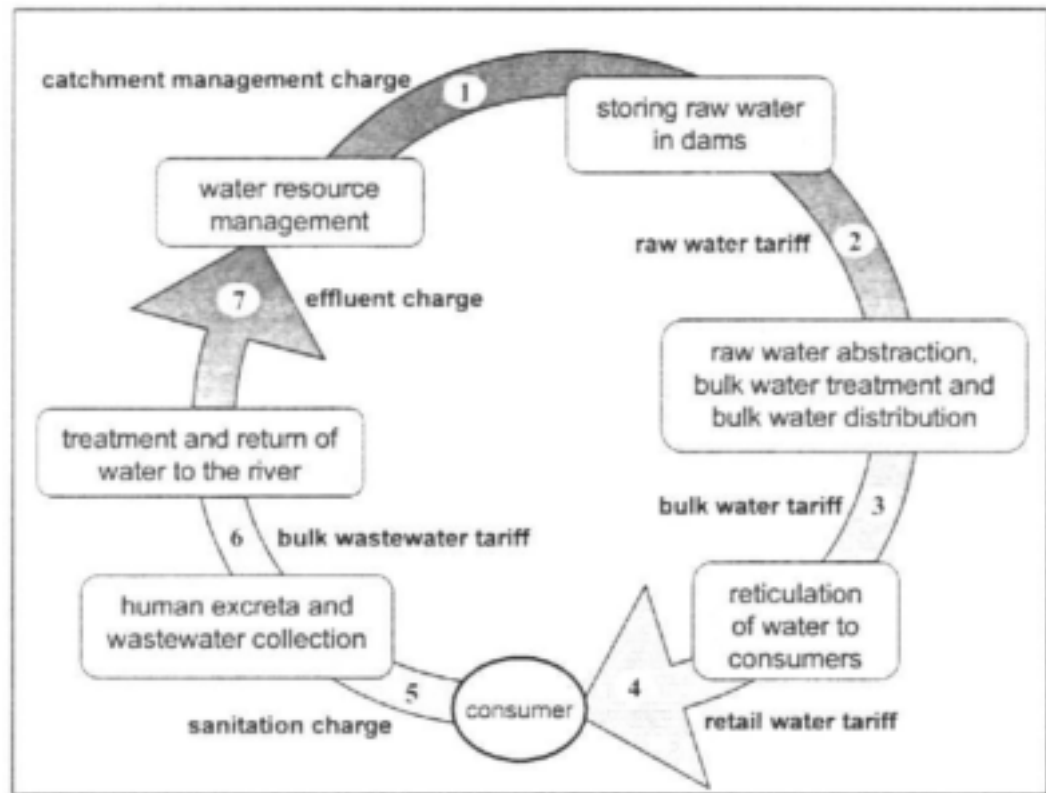
Historically, regulation of the water sector has focussed on the technical and environmental aspects of water services. More recently (post-1994) greater attention has been paid to the regulation of services for public benefit, specifically with respect to the universal provision of basic services (see above). Little attention has been given to economic regulation to date.

The water sector is a significant and important industry in South Africa. Annual water sales for industrial and urban water use are estimated to be between 2 000 and 4 000 million kl per annum. The annual turnover of the water industry is not accurately known but is estimated to be in the region of R10 billion. An overall efficiency gain of just 1% would result in a benefit to the country as a whole of R100 million per annum.

2.4 The scope of economic regulation – the water value chain

The conceptual representation of the full water cost and pricing chain is shown below.

Figure 2: Water cost and pricing chain



Source: Adapted from the national Strategic Framework for Water Services

The scope of the economic regulation of *water services* comprises the bulk water cost/tariff through to the bulk wastewater cost/tariff, including the retail water and sanitation costs/tariffs (and the activities associated with these prices). Typically, the bulk water and wastewater costs make of about 50% of the total costs of water and sanitation service provision respectively. Hence the economic regulation of these bulk costs is equally important compared to the regulation of the retail costs and tariffs.

The total costs of service provision also include the costs/prices 1 (resource management), 2 (raw water) and 7 (DWAFA administered effluent charges). Hence it is important that the regulation of water services are integrated with the regulation of these costs/prices within a comprehensive regulatory framework.

Raw water costs are regulated in terms of the National Water Act. This regulatory regime is different to that provided for water services which are regulated in terms of the Water Services Act.

3. Economic regulation in the South African environment

3.1 Introduction

The research undertaken in this project adds value by contributing to a greater understanding of the economic regulation of water services in South Africa. This project was undertaken in parallel with the drafting of the national Strategic Framework for Water Services.⁴

The information, knowledge and developments in this project contributed to the policies and strategies set out in the national Strategic Framework.⁵

3.2 Principles informing the regulatory framework

Basic **principles** governing a good regulatory framework include:

1. **Institutional clarity:** Institutional clarity concerns the definition of the relevant stakeholders and their roles and relationships.
2. **Clarity of mission and purpose:** It is critical that the regulatory framework establish a clear mission and purpose – for example “to regulate the water sector in accordance with government policy and law, so as to meet the needs of existing and future water consumers and stakeholders in the most efficient, cost-effective and sustainable manner possible”.
3. **Representation of all Stakeholders.** The regulatory framework must ensure that the interests of all stakeholders are adequately heard, whilst none of them should have excessive influence. It is particularly important that there should be no conflict of interest within a significant party.
4. **Integrity.** The decisions of the regulator(s) should be beyond reproach and should reflect an appropriate balance between the needs of consumers (present and future) and the financial sustainability of the industry.
5. **Accountability.** The regulator(s) should be accountable to government and to the public for its decisions.
6. **Effectiveness.** Regulators can set targets for improved efficiency and better service, but such targets are meaningless if they cannot be enforced.
7. **Capacity to fulfil functions.** The effectiveness of the institutional framework will also depend critically on the capacity of institutions to fulfil their functions.

Within the South African context, additional principles include:

⁴ The project leader of this project was also the lead drafter of the national Strategic Framework for Water Services.

⁵ A reading of the national Strategic Framework alongside the Phase I report for this study will show the clear linkages between the two.

- respect for the **executive authority of local government** in relation to water services;
- **integration with local government regulatory framework** (Municipal Structures and Systems Acts);
- finding an **appropriate balance between standards, costs and affordability**;
- **integration with the water resource management** regulatory framework.

To a large extent, these principles have been incorporated in the national Strategic Framework (see Section 7 of the Strategic Framework).

3.3 The policy context

The policy framework within which regulation is to take place is set out clearly in the national Strategic Framework and is not repeated here. Two points are elaborated on below.

DWAF has given a lot of attention to **environmental regulation**, especially on the water resources side (see National Water Policy White Paper and the National Water Act). A pricing strategy for wastewater is under development at present. Key issues which still need to be addressed include:

- The integration of environmental regulation with economic regulation.
- Trends in international best practice related to the regulation of the environment using economic instruments and incentive regulation (for example, tradable permits).
- The relationship between WSAs and CMAs with respect to environmental regulation. Particular attention will have to be given to the relationship between the regulation of the water resource and the regulation of water services.

These largely concern the interface between water resources and water services. Whilst this issue was recognised in the Strategic Framework, thought still needs to be given to the practical implementation of the considerations highlighted above.

The key aspects of **social (or public benefit) regulation** are universal access to basic services and minimum service standards (including potable water quality). This framework is already fairly well developed and is set out in the national Strategic Framework for Water Services (DWAF, 2003) and in the Water Service Act 108 of 1997. Water Services Authorities are required to develop and publish Water Services Development Plans which show how they are meeting defined social objectives such as supplying (or planning to supply) at least a basic minimum level of water service to all residents in their area of jurisdiction.

The Free Basic Water Services policy is a key component of social regulation. Detailed strategies for the implementation of the policy have been developed.

The requirement that Water Services Authorities develop (and implement) Water Services Development Plans is clearly a major step towards building the regulatory system. Nevertheless, concerns have been raised as to both the ability of WSAs to carry out these plans and well as the capacity of DWAF to monitor these plans in an effective way. This issue has been addressed, at least in principle, in the national Strategic Framework.

It is important to note that economic, social, environmental and technical regulation need to be integrated with each other and that there are often trade-offs between these different components of regulation which need to be managed. For example, high technical standards may have cost and affordability implications which may affect the financial viability of a service provider. The practical implementation of this will need to be developed in the regulation strategy provided for in the national Strategic Framework.

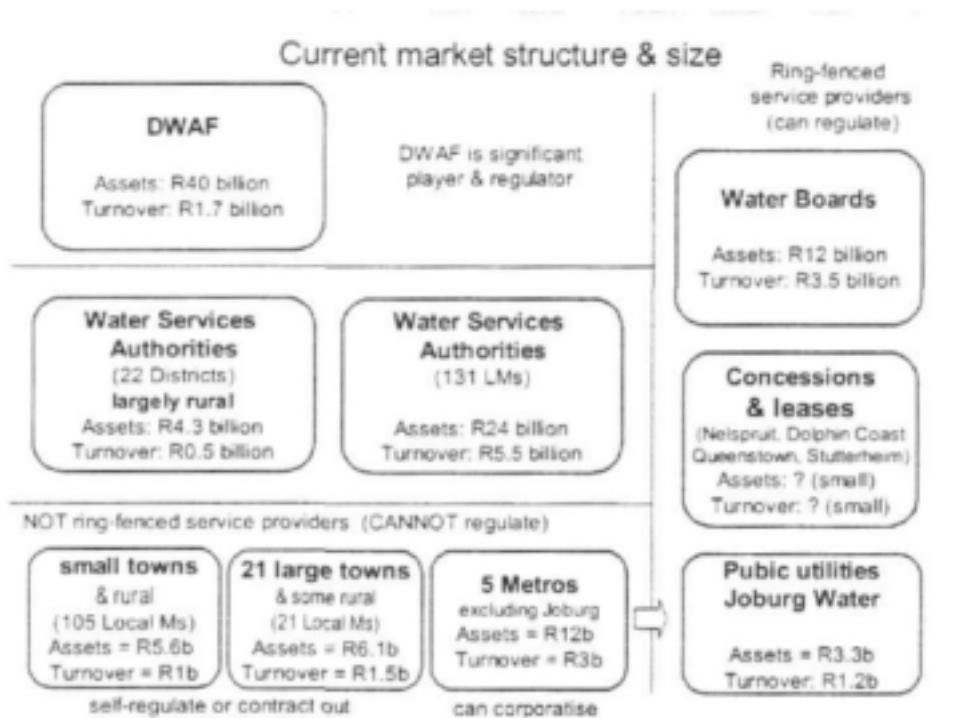
3.4 Institutional context

The institutional framework is set out clearly in the national Strategic Framework for Water Services (DWAF, 2003). It is important to note that the institutional reform as envisaged in the framework will have important implications for economic regulation. Because the end-state of the reform cannot be known beforehand it is not possible to predict the specific implications except to note that the choice between local and national ownership of regional water services providers will have a profound impact on where and how economic regulation of these providers takes place.

3.5 Current market structure

The current market structure is depicted in Figure 3.

Figure 3: Current water market structure and size



Source: Author's estimates from primary data

The significant features of this market are highlighted below.

Uncertainty. The first point of note is that no accurate picture of the market structure and size exists. As far as is known, this is the first attempt to put together a "comprehensive" picture showing assets and turnover (value of water sales) for the market as a whole. The data is very coarse, based on reported turnover (by water services authorities) and imputed asset values (current replacement cost).

DWAF is a significant player. In the overall context, DWAF is a very significant player. Thus the actual situation is very significantly different to the institutional vision put forward. The DWAF assets include water resources assets. The split between water resources and water services infrastructure was not obtained.

Ring-fenced assets. The value of the assets that are ring-fenced and that can therefore be effectively regulated is small (less than 20%). The majority of this sits in the Water Boards. There are only two municipal owned ring-fenced public utilities for water services which are significant (Johannesburg Water and ERWAT).

Corporatisation. Obvious first candidates for ring-fencing are the other five metros with total assets of about R12 billion and some of the 21 large towns (total assets of about R6 billion).

Private sector contracts. There are only four private sector contracts in South Africa (DWAF, 2003). It is obviously important that these are well regulated.

Self-regulation. Much of the sector is self-regulated in the sense of the water services authority also being the water services provider. There are 22 districts which comprise large rural areas (total assets of about R4 billion) and 105 local municipalities (with total assets of about 6 billion). In the longer term much of these areas are likely to be continued to be managed by municipalities as service providers.

Diversity. The current market structure is diverse in terms of a number of parameters affecting the appropriate nature of regulation:

- The *technology* employed and ranges from simple small local rural schemes to sophisticated large region-wide schemes.
- The *scale* of provision ranges from small local schemes (less than 10 kilolitres per day) to large regional (many hundreds of Megalitres per day).
- The degree of *vertical integration* varies from fully separate retail, bulk and resource operations to fully integrated source to tap operations.
- The degree of *sector or service integration* varies from standalone water utilities (only doing water retail, for example), to water and sanitation utilities to fully integrated municipal operations involving in roads, stormwater, electricity, solid waste etc.
- The degree of *business integration* varies from separated engineering, financial and customer functions to fully integrated business integration.

3.5.1 Implications for regulation

What does this mean for the scope of economic regulation? The following conclusions can be drawn.

Regulating vertically integrated regional utilities. Although not significant at present, this institutional form may become more important in future.⁶ If this is the case, then the regulatory capacity to regulate integrated utilities should be developed in parallel with the reform of the sector.⁷ This institutional form will require a strong (and by implication probably independent) regulator.

Regulating water boards. Regulation of the bulk services function of water boards should, in theory, be relatively straight forward. The asset base is well defined and costs should be transparent. However, in practice, water boards are not effectively regulated from an economic point of view. There is no transparency in the regulation,

⁶ The current national institutional reform process appears to have this outcome in mind.

⁷ This is a strong recommendation from a recent World Bank study on water services aggregation (not yet published).

the methods used are not clear, and there is not adequate capacity (and the political will?) to undertake the effective economic regulation of water boards. The annual turnover of water boards is significant (R3.5 billion per annum) and more effective regulation of this business could bring important economic benefits.

Regulation of municipal entities. This follows a more traditional utility regulation model. However, the regulator (the water services authority) is also the shareholder. There may be conflicts of interest within the water services authority as a result of this. For this reason, national oversight may be necessary. The Johannesburg Water Utility is the only example of this mode of regulation in South Africa. This model may be followed by other cities and hence it is important that this model set appropriate precedents. Much still needs to be learned about regulation in this context.

Self-regulation. Much of the sector is self-regulated in the sense that the water services authority (the regulator) is also the water services provider (the operator). True economic regulation is not possible because costs allocations are not transparent and there is not separate accountability (in the true sense of this word) for performance. We do not have enough of a sense of how much of an impact economic regulation would have on the performance of this part of the sector. Is there evidence of monopoly profits, gold plating or under-investment? How extensive is the problem? The information to answer these questions with any degree of certainty does not exist.

Clarity in nature of water services authority and water services provider contract (where WSP is an "external mechanism"). There is a need for greater clarity in the essential characteristics of different types of WSP contracts (concession, lease, management contract) and the appropriate allocation of responsibilities, risk and reward, especially in the case of public-public contracts. (The national strategic framework has addressed this concern to some extent in its financial requirements for future contracts.) At this point we do not have comprehensive information related to the number of WSA – WSP contracts that exist and what the nature of these contracts are. In theory, this information should be available in the WSDPs but the sector is in a state of flux and there may be significant change over the next few years. Basic tools for economic regulation are needed to assist in the development and regulation of these contracts. (The national strategic framework has addressed this concern to some extent in its financial requirements for future contracts.)

Regulating public-public contracts. Public-public contracts may be more difficult to regulate effectively due to the absence of two important tools for regulation: (1) competitive procurement to ensure a cost-effective base-line, and (2) suitable enforcement mechanisms – a cursory reading of the MFMB seems to imply that WSAs cannot impose fines on other municipalities (and public entities?) as a result of lack of performance.

Regulating public-private contracts. Competitive procurement is a requirement (so better baseline information should exist compared to public-public contracts) and enforcement should, in theory, be more effective than public-public contracts. However, there are likely to be important information asymmetries which could be exacerbated by a strong profit motive. Hence there is likely to be a need for national assistance to WSAs in the development and regulation of public-private contracts. At present there is a lack of capacity at national level to undertake this task effectively.

3.6 Under-investment

One of the significant problems facing the water services sector is under-investment. There is evidence of under-investment in two areas:

- Inadequate services (especially to poor households)
- Deterioration of existing infrastructure as a result of inadequate maintenance and rehabilitation.

The reasons for this are two fold:

- There is a lack of affordability among poor households and hence public subsidies are needed to fund these services. Where inadequate services persist over time, then the subsidies allocated to these areas either insufficient or are inefficiently spent.
- Municipalities providing water services may prefer to spend their limited resources of other priorities rather than ensuring existing infrastructure is maintained in a good condition.

There are two imperatives related to the problem of under-investment:

- Public policy should seek to ensure that subsidies are appropriately allocated and used efficiently;
- The institutional environment should ensure that managers of water services have the right incentives (and adequate resources) to adequately maintain infrastructure. (In practice, the latter may well mean that water services should be provided by an autonomous agency. This question is being addressed in the national institutional reform process.)

Neither of these imperatives are the direct or sole preserve of economic regulation and hence are not dealt with in any detail in this report.

4. Gaps in the current regulatory framework

4.1.1 Constraints to economic regulation

Municipalities face a number of major constraints in implementing effective systems for economic regulation.

Firstly, there is the problem of defining the asset base and efficient costs of service provision. Municipal water services accounts are typically not ring-fenced and hence it is often not possible to distinguish between costs and assets associated with water services and those associated with other municipal services with any degree of confidence or accuracy. In this context it is not possible to define target rates of return, nor to establish appropriate cost-based benchmarks for the measurement of performance. The recent introduction of Generally Accepted Municipal Accounting Practices (GAMAP), based on generally accepted accounting practices (GAAP) represents a significant step in the right direction. Whilst the full implementation of GAMAP will assist in defining the underlying asset base, it will not in itself provide an adequate methodology for correctly allocating joint costs between services.

Secondly, municipal capacity is weak in many cases (DWAF, 2003). Economic regulation is a complex process and may require sophisticated technical, accounting, economic and legal skills (depending on the nature and extent of regulation). Even the largest municipalities face significant challenges in adequately establishing the skills base and competencies required to regulate water and other services in the context of a changing municipal service environment. Hence it is desirable to build regulatory capacity both within municipalities and also externally to support municipalities.

4.1.2 The economic regulation of water boards

Water Boards are owned and controlled by the national government. The Minister of Water Affairs and Forestry has powers to appoint board members and to approve business plans. The current method of economic regulation of water boards is not transparent. It is not clear what methodologies are used to assess the business plans and to approve proposed tariff increases. The consultation process leading to the Strategic Framework revealed a general and widespread unhappiness amongst municipalities with the governance and regulation of water boards. At the same time, water boards are not happy with the current status quo. They feel they are disadvantaged vis-à-vis the private sector as they must conform to stringent public sector legislation (the PFMA) not applicable to private sector operators. They propose a more level playing field.

4.1.3 Private operator perspective

Private operators view the current policy and legislative environment as "anti" private sector.⁵ They believe they are disadvantaged vis-à-vis water boards and other public agencies who are not required to contract through competitive procurement procedures. They believe that Section 78 of the Municipal Systems Act and the public-preference contained in the Water Services Act places undue procedural

⁵ These views were expressed by the private sector representatives during consultations between private sector and DWAF during the process of developing the national Strategic Framework (DWAF, 2003).

obstacles in their way as well as provides a negative environment in terms of the perceived benefits of private sector involvement.

4.1.4 Gaps in the regulatory framework

The above discussion has set out the context for, and sketched the potential scope of, economic regulation in South Africa. The discussion revealed a number of gaps in the regulatory framework. These are summarised below together with the actions required to address these gaps. The gaps that fit most closely with the scope of this research project are highlighted in bold.

Gap	Actions to remedy gap
1. Water Boards are not subject to adequate economic regulation.	a) Resolve status of water boards. (Should ownership-control continue to rest with national government?). b) Develop standard methodology for the economic regulation of water boards (rate of return on assets is a good starting point) c) Develop capacity to undertake economic regulation of water boards. There should be an annual detailed economic, financial and technical review of water board business plans and tariff proposals. The private sector could possibly assist under the auspices of DWAF management. d) Enforce proper ring-fencing of businesses.
2. Johannesburg Water is the only public retail water service provider in South Africa that can be adequately regulated at present.	a) Use Johannesburg as a role model for the development of the methodology for the economic regulation of public retail water utilities. (Rate of return on assets is a good starting point.) b) Develop national capacity to understand the regulation of Johannesburg Water. c) Promote the financial ring-fencing of water and sanitation services within local government, starting with the larger urban areas, to better understand the real costs of service provision and the need and potential benefits for economic regulation in the urban sector. d) Identify appropriate regulatory models.

3. There is inadequate capacity at the national level to assist WSAs in their negotiations with both private and public operators, especially with respect to significant concession, lease and management contracts.

4. Where the WSA is the WSP, there is inadequate internal regulation.

5. There is confusion in the nature of contracts, particularly between public agencies.

6. The playing field is not level. There is no good reason why public – public contracts should not be subject to competitive procurement procedures. There should be better enforcement mechanisms for public-public contracts. Legislation setting out procures for involvement of the private sector overlaps, is confusing and sends out the wrong message.

7. Regionalisation: The proposal to “regionalise” water services provision (create regional source-to-tap water services providers) which appears to be supported by DWAF, SALGA and SAAWU will not proceed without a clear policy on ownership and control of these regional entities

DWAF need to urgently develop this capacity (can be done in tandem with the capacity need referred to above for the regulation of water boards). The private sector could possibly assist under the auspices of DWAF management.

Appropriate methods of regulation are not clear. Is it possible to regulate in the absence of good cost information?

Contracts should be more clearly defined in terms of the allocations of risk and responsibilities and there should be clearer guidelines related to appropriate allocations of risks and responsibilities in relation to rewards with respect to:

1. Concession contracts
2. Lease contracts (standard, affermage and enhanced lease)
3. Management contracts
4. BOT contracts

Legislation should be amended to:

- a) Remove inconsistencies and confusion with respect to decision-making, procurement and contracting procedures.
- b) Promote three key principles: (1) ensure the protection of the public interest, (2) ensure proper procedure, and (3) ensure level playing field.
- c) Require competitive procurement for all external water service provider contracts exceeding a certain size in annual turnover.

A clear national policy on ownership and control of water services infrastructure (both bulk and retail) needs to be developed.

8. No locally appropriate methodologies exist for the implementation of economic regulation.

There is an urgent need to develop and implement practical methodologies for the economic regulation of water services. Four standard methodologies should be developed:

- a) Rate of return methodology for application to water boards
- b) Rate of return methodology for application to an urban retail utility (Johannesburg Water)
- c) Methodology for economic assessment of concession contracts, adapted from a rate of return method for an urban water utility.
- d) Methodology for economic assessment of lease contracts, based either on an adapted rate of return method for an urban water utility or a cost-plus method.

9. Regulation of raw water pricing is not adequate due to the conflict of interest between DWAF as regulator and operator.

There are two basic solutions to this:

- a) DWAF exits direct involvement in raw water provision; or
- b) An independent regulator

5. Learning from the literature

5.1 Introduction

Five working papers were written as part of this project (see the Annexures listed in the Preface), each investigating specific aspects of economic regulation. The key lessons from these pieces of research are summarised below with specific reference to South Africa. For the sake of economy of space, the key findings and the recommendations related to these findings are kept together. More emphasis is placed on the recommendations. The reader is referred to the Annexures for more detailed findings.

5.2 Learning from African experience

A review of the experience of economic regulation in Africa was undertaken (see Annexure A). The four main kinds of regulation found in Africa are as follows:

1. Government is the service provider and regulator. In this case, there is little literature on the subject. However, there is broad consensus that effective regulation in this context is very difficult to achieve and unlikely to occur.

2. Government is the regulator of an arm-length service provider providing a service in terms of a mandate (no time limit). The service provider could be a public utility (for example, the Water and Sewerage Authority in Lesotho) or a private company (for example, SODECI in Côte d'Ivoire). Opinion related to the performance of SODECI is divided. Some hail this as a success story while others are deeply critical. The performance of government regulation of public water utilities in Africa is very mixed. In many cases there is a high degree of political interference (on the location and type of investments, for example) and strong pressures to keep prices below true economic and financial costs. Most commentators recommend an independent regulator in this context.
3. Government is the regulator of services which are provided in terms of a time limited concession contract (for example, Dolphin Coast in South Africa). Pure concession contracts with full risk transfer are relatively rare in the water sector in Africa. The efficacy of contract regulation in this case very much depends on the details of the contract, the capacity of the regulator, the competitive pressures that can be brought to bear and the relative negotiating strengths of each party.
4. Government (or an independent regulator) is the regulator of the asset holding authority (a public entity or government itself) and of a lessee (a private company operating the service and assuming revenue risk). There is general agreement that independent regulation is desirable in this case. This arrangement is more common in Africa. It can work well provided the asset holding authority acts as a strong and competent counterpart to the lessee.

Some key lessons arising from the review of the African experience of regulation include the following:

- **A suitable legal and institutional framework.** The potential effectiveness of regulation is strongly linked to the institutional arrangements which can either hamper or promote effective regulation.;
- **Independence.** A key advantage of setting up an independent regulator is the greater transparency achieved. If appropriate skills are available, a multi-utility regulator might help to capitalize on scarce human resources, and promote learning between sectors. This would also reduce the risk of regulatory capture.
- **Separation of roles.** While there is a general consensus on the desirability to separate operating activities from regulatory activities, in practice this separation is not easily achieved.
- **Clear role definition for the regulator.** The roles and responsibilities of the regulator need to be clearly defined, with clear objectives. The regulator should focus on price levels, operational efficiency and the quality of services provided;
- **Power.** Notwithstanding the establishment of an independent regulator, regulatory performance can be compromised by institutional outcomes which

seek to retain real power in other institutions. In other words, the establishment of an independent regulator does not guarantee success. The government agency currently responsible for the sector must be willing to handover control to the regulator.

- **Capacity.** Capacity to regulate effectively is in short supply in many African countries and it is important that the institutional and regulatory framework take cognizance of this. The required human capacity must be developed in order to undertake effective regulation.
- **Clear dispute and conflict resolution mechanisms** must be established, that have the capacity and the authority to make binding recommendations/decisions on all parties, including government.
- **Credibility.** The regulator must be seen to be impartial, and to have the ability to perform its functions, and impose penalties where required.

5.3 Learning from the Australian experience

A case study was undertaken of economic regulation of water services in Australia (See Annexure B). Australia was chosen because of its mix of governance and ownership arrangements and because of its reform experience.

A vision. Much of the reform in the water services sector in Australia was the result of a national vision embodied in the National Competition Policy. This created the necessary leadership and initiative to carry through the reforms. By contrast, the drive for sector wide reform, specifically with respect to improving the economic regulation of water services, appears to be relatively weak in South Africa.

Incentives. The National Competition Policy payments from the federal government were a key driver of reform at State level in Australia. The use of appropriate incentives from national government could be an important tool for achieving economic reform in the water sector.

Separating regulation and operations. In terms of the institutional context, South Africa (and in particular DWAF) is currently in a similar position to where Australia was *before* the CoAG water reforms, with DWAF responsible for water resource management, standard setting, regulatory setting and operations. Under the CoAG Agreement, as far as possible these roles were separated institutionally, with each role undertaken by separate agencies. This would seem to be an important starting point for reform in South Africa.

Improving efficiency. Although improved efficiency in service delivery is one of the principles underpinning the water reform process in Australia, in practice the emphasis seems to have fallen on water-use efficiency. (For example, the 2002 NCP assessment did not refer to improved operational efficiency.) More generally, and with the exception of IPART, little mention is made of cost-efficiency gains. At the moment IPART is grappling with how to ensure that reductions in operational costs

are due to real efficiency gains, and not deteriorating service levels. It is striking that the overall assessment of regulatory reform in water services in Australia has not placed more emphasis on efficiency gains achieved as a result of regulation.

Reporting. There has been a striking improvement in the quality of reporting as a result of regulatory reform.

Over pricing? There does not appear to be convincing evidence of over-pricing prior to regulatory reform in Australia. If anything, the main problems seemed to be under-pricing, poor pricing incentives (property-based taxes) and under-investments.

A role for price caps. There is often strong resistance on the part of utilities and the private sector to price caps. Nevertheless, New South Wales successfully implemented a cap on the *rate of price increases*. This can be useful in certain contexts and in the light of the role of water as a social good.

Costs and benefits of regulation. The Australian concept of Regulation Impact Statements are worth considering in South Africa. These would help to assess alternative regulation policy option in terms of a cost-benefit analysis, to assess the impact of proposed regulation on different groups in society. This is a very undeveloped area in South Africa will regulations often imposed with no consideration of the overall costs and benefits. For example, no cost-benefit analysis was undertaken prior to the Fluoridisation legislation being implemented in South Africa.

Limits to regulation. Where states constitutions give responsibility to local government, these have been insulated from the national regulatory reform initiative. This poses the question: to what extent can national government influence regulation and performance at local government level?

Local regulation. The South African situation (aside from the Water Boards) is most similar to New South Wales, Queensland and Tasmania, where local authorities are responsible for water reticulation and sewerage. While New South Wales has a strong regulator with price-setting powers for several utilities, it has concluded that it will be impossible to directly regulate all 126 local water authorities in the state, and is instead advocating principles with which local authorities and their elected officials can regulate themselves. Tasmania and Queensland have also released pricing guidelines to be used by local government, rather than attempting direct regulation.

Local scrutiny. Where municipalities run water services, the power of scrutiny by locally elected officials is thought to be sufficient to limit the extent of monopoly pricing. Hence, regulation of local municipalities by state regulators is with a "light hand" and is limited to guidelines about how to go about setting prices.

These last two points are probably the most important for South Africa. *To what extent can national government realistically expect to be able to regulate some 154*

water services authorities (and even more water services providers? Is local scrutiny an adequate mechanism for price regulation?

5.4 Learning from the experience of Chile

Annexure C reports on a case study of economic regulation of water services in Chile. Chile was chosen because of its unique model of regulation (the ideal company model) and because of its successful application of subsidy policies. The key lessons are summarised below.

Commercialisation. The most important and successful phase of the Chilean water sector reform demonstrates that improvement in the provision of water and sanitation services in an efficient manner can be achieved, primarily by reforming the sector along commercially oriented lines with incentive-based regulation.

Regulator autonomy. Constitutional separation of regulatory and administrative functions of the water and sanitation sector, coupled with the institutionalisation of an autonomous regulator, was one of the most important and early phases of Chile's reform, which South Africa would do well to emulate.

Roles and responsibilities, transparency, dispute resolution. Chile ensured the implementation of transparent and detailed regulatory policy and administrative procedures that separate and clearly define the roles and obligations of each party involved. In South Africa, policy and the procedures should explicitly address the scope and parameters of interaction between the utilities, the regulator and consumers. Most importantly, policy and procedures should ensure the quick resolution of conflict by explicitly addressing how, by whom, and how fast discrepancies shall be resolved.

Modelling efficiency. For the purpose of setting "efficient" water tariffs, Chile uses a fictitious model company for each actual company, on the assumption that the model company operates efficiently within the constraints of demographic, geographic and technological features. The models provide high productive efficiency despite their high complication and the high level demand of institutional and administrative capacity. To ensure optimal tariffs along commercial lines it is highly recommended that South Africa should in the medium term consider building simpler model firms that could serve as benchmarks, at least to the larger water utilities.

Subsidies. Although the Chilean-type means-tested direct subsidy has the advantage of reaching the targeted population with minimum risk of resource leakage to unintended users, it demands universal metering of water consumption and high administrative and institutional capacity, which South Africa may lack at present. Nonetheless, Chile's clearly defined, well-designed and well-administered criteria-based subsidy structure is something that South Africa would do well to implement. Alternatively, South Africa may benefit a great deal by adopting Panama's model of

zone-based subsidy, as this can be achieved relatively easily by drawing a poverty map based on living standard surveys.

Some broader lessons that may be drawn from a more general review of the literature on regulation in developing experiences include the following:⁹

Institutional reform. Regulatory reform must be accompanied by institutional reform if it is to be effective. See Annexure C.

Political will. Regulation is only effective where there is the political will.

Capacity. Adequate regulatory capacity typically is in short supply in developing countries. Regulatory approaches must be consistent with the available capacity. See, for example, Kim and Horn (1999).

Multi-sector regulation. In view of the capacity constraints, multi-sector regulators are advocated and are being put in place in a number of developing countries. See, for example, Teljeur *et al* (2003).

Regulatory independence. Internationally there is strong advocacy for regulatory independence. See, for example, Smith (1997).

5.5 Learning from Johannesburg

Annexure D is a write-up of a case-study of the Contracts Management Unit in the City of Johannesburg and its role as a regulator of Johannesburg Water. Key lessons are summarised below.

Still learning. The contract management unit (CMU) is still very much in the process of learning. Johannesburg Water (JW) was only established in January 2001.

Effectiveness. It is too early to determine what effect the CMU has had on utility performance.

Better reporting. The separation of water services into an arms-length utility has resulted in much improved reporting and transparency in the operations of the service.

Information asymmetries. There is a contest over information. CMU wants to know as much as possible about how the business operations, its costs etc. JW feels that this is intrusive and not necessary.

Clarifying the shareholder and client roles. As shareholder, Johannesburg City wishes to receive an adequate return on its assets. As client the city needs to ensure that consumers receive universal (basic) services and value for money. This tension was not fully appreciated at first. The CMU unit needed to be restructured into two separate units to manage this tension and reporting lines changed. It should also be

⁹ This section will be strengthened once the literature review of regulation of water in developing countries is completed.

noted that this City of Johannesburg is also acting as a compulsory service provider to Joburg Water in some areas (for example, customer billing and cash collections).

Scale and cost. The CMU budget is about R17 million per annum. This represents only about 0.3% of the turnover of the Utilities, Agencies and Companies regulated by the CMU due to their number and scale. Nevertheless, effective regulation is expensive and it is not clear yet at what scale of operation regulation becomes uneconomic. Regulatory Impact Assessment could be used as a tool to decide on the efficacy of regulation in any particular context.

Innovative use of private sector. The private sector management contract is structured so as to support the development of local management and technical capacity. This is a good use of the private sector in the South African context.

Basis for regulation. The CMU does not have a good operating model of JW. The CMU does not implement any formal economic regulation of JW. The tension between the shareholder (economic) and client (social) roles have not been made explicit enough and are still confused. However, this is being addressed.

Costs of regulation. The costs of regulation may be significant and it is important that the benefits of regulation exceed the costs. (In the case of the CMU, the costs of regulation account for about 0.8% of the revenues of the regulated entities.) Actual costs and benefits of regulation will depend on the specific institutional context as well as on many other factors. Hence it is not wise to generalise. The Strategic Framework (DWAF, 2003) provides an appropriate framework for assessing the benefits of regulation vis-à-vis the costs, namely regulatory impact assessments.

5.6 Tools and methods for economic regulation

The tools and methods of economic regulation are reviewed in Annexure A to the Guideline (see Preface).

The application of economic regulation to South African water service providers poses a number of questions and challenges. Some of the key challenges are outlined below in point form and will be discussed further in other components of the overall project.

- *Utility ownership:* The experience with economic regulation primarily relates to the regulation of privatized utilities. The translation of this experience to the regulation of municipal owned utilities in South Africa will pose many difficulties. The incentives facing managers of local authorities differ from those in the private sector, and many other factors constrain productivity improvements in the public sector which are outside the control of utility managers.
- *Ring-fencing requirements:* The determination of costs is the starting point for all economic regulation methods. This determination cannot be done with a sufficient degree of accuracy if the operations that are

regulated and their financial reporting are not well separated from non-regulated activities. This implies that the first step in establishing a regulatory system for a local water service provider is the ring-fencing of the operations of the provider. Experience has shown that this is not an easy exercise, and even the larger municipalities struggle to ring-fence operations. In the case of smaller authorities, where water services share many operational costs with other services (such as billing, management support, and payroll control) there will be enormous challenges in the separation of the costs of these services.

- *Calculation of costs of debt and equity:* The experience with the calculation of the costs of debt and equity primarily relate to applications in the private sector. There are a number of factors that will differ in determining these parameters for public utilities. These include different risk profiles and borrowing costs; the availability of internal capital funds; and difficulties in assessing the relevant return on equity for a public sector owner.
- *Limited scope for benchmarking:* Although benchmarking appears to offer some way out of the informational requirements of the other regulatory approaches there are likely to be serious difficulties in abstracting away the different local conditions that affect costs of water supply. These include both physical differences in topography and water availability as well as historical differences and differences in local costs of labour and services and local levels and standards of service. It is not clear that these difficulties are surmountable.
- *RPI-X in a developing country context:* The appropriate price path under RPI-X may be difficult to determine in a developing country setting where there a significant new infrastructure extension requirements for new, low income, consumers. In particular may be hard to establish a price-path when the required capital costs are not known. Even in the UK, which has more stable institutions with longer reporting histories, there are serious problems with forecasting financial performance over a five year review period (Cooper, 1998). In South Africa this forecasting is likely to be yet more difficult. Some factors, which may outside of the control of the utility, may have a dramatic impact on performance. Important variables include the degree of cost-recovery from consumers and input costs (particularly raw or bulk water supplies). Regulatory systems will need to account for these unknown variables – either by improving their information and understanding of them or by accommodating the variability they create from the regulatory price setting process. Cost recovery is particularly difficult as it should be a

performance requirement for utilities but it is not always wholly within their control.

- *Industry structure and regulation:* The local industry structure affects the scope of regulation and price controls and should help to determine the appropriate point in the water supply system at which to impose regulatory controls. For example, there may be little point in attempting to regulate water service providers that are themselves subject to monopolistic behaviour from suppliers, primarily Water Boards who may not be similarly regulated.

Tariff structure and economic regulation

Pricing structure is an important efficiency and equity concern. It is important to have an appropriate balance of revenue from different consumers, allowing the cross subsidisation of poor consumers while not over-burdening productive activities and firms with unduly high prices. The balance between access and consumption charges is also important in creating the correct incentives for network expansion and consumption.

A utility can perform poorly by having an individual service price either too high or too low relative to cost, or it may have an inefficient mix of revenue coming from access and service prices (Albon, 2000). The regulation of tariff structure is clearly a component of economic regulation of water services. This aspect of regulation has been well dealt with in South Africa and has formed an important part of water services policy and guidance from national government. The focus of this research project is on the overall revenue and price parameters that can be used to regulate water utilities and no further consideration is given to tariff structure. However, any expansion of the regulatory system for water services in the country would need to ensure that approaches to internal tariff structure and overall price and revenue levels were consistent and compatible.

Location and capabilities of the regulator

The location, capabilities and incentives of the regulator itself are important issues in the eventual success of a regulatory system. This review has focused on the methods used, rather than the institutional approach to regulation. However, the institutional setting of the regulatory authority is a core issue in the establishment of a system of economic regulation.

A first question is the appropriate location of a regulator within the government hierarchy. For example, should regulatory authority be located alongside water service authority or should it be at a higher level of government? Related to this question are a range of issues concerned with the regulatory independence and the potential "capture" of the regulator by the regulated utility or other interest groups (consumers and government, for example). These issues are dealt with in detail in the public choice theory and related literature (see McLean, 1987 and Klein, 1996).

A fairly pessimistic view is expressed by Irwin (1999) about the capability of regulators in developing countries, with particular reference to newly privatized or corporatised utilities. He asks, "how well can we expect a government to regulate when the same government performed poorly when it provided the infrastructure service itself. If the government lacked the information it needed to run the infrastructure company well, will it acquire the information needed to regulate well after privatization? Will a government that succumbed to pressures to pursue socially harmful infrastructure policies while it was an owner be able to resist those pressures as a regulator? Will politicians and officials who extracted bribes from suppliers under public ownership refuse to accept them from a regulated private firm?" (Irwin, 1999)

6. Conclusions

6.1 Scope for economic regulation in South Africa

The potential scope for economic regulation in South Africa is described with reference to the likely range of governance models below.

Table 1: Implication of governance model for economic regulation

Governance model	Scope for economic regulation	Importance in South Africa and scope for improving economic regulation
Water services authority is the services provider.	Little scope for economic regulation unless service properly ring-fenced. Social and political pressures likely to dominate over economic regulation.	Most common (default) governance model in South Africa. Difficult to gauge the scope for efficiency improvements through economic regulation. <i>Revenue enhancement is the driver of reform.</i>
Public entity (ownership-control rests with one or more WSAs)	Traditional utility-style regulation through, for example, return on assets regulation, but conflicts of interest as a result of ownership (regulator is also shareholder). Could have a national utility regulator (or national could oversee local utility regulators).	Only one example in South Africa at present (Johannesburg Water). But could grow, especially in large cities. Is there the political will? Very important that regulation of this one contract becomes a role model for others who are thinking of following suite.
Public entity (ownership-control rests with national government)	Traditional utility-style regulation. Conflicts of interest as a result of ownership. Need an independent regulator to resolve this.	Water Boards. Does DWAF have the incentive to regulate effectively? Reform water boards so that become locally owned or establish an independent regulator.
Concession (with an external public or private entity)	Public. No competition through entry into market. Cannot assume interests of partnering public entity are benign. No good reason to exclude	Little transparency in existing public-public contracts (for example, Rand Water – Emfuleni) so hard to assess their true nature. Is it more like a concession or a lease? Can

Governance model	Scope for economic regulation	Importance in South Africa and scope for improving economic regulation
	competitive procurement. Private. Competitive procurement, but danger of adverse outcomes resulting from information asymmetries over long time period (up to 30 years) as for public. Need a strong regulator to manage contracts.	<i>public-public contract incorporate effective enforcement mechanisms?</i> Within a policy environment of promoting public-public partnerships, this contracting model likely to become more important. At present, there is not the regulatory capacity nor the tools to manage concession contracts (both public-public and public-private) – urgently need to develop national capacity to assist.
Lease (or enhanced lease or "affermage") – with public or private entity	As above. Less risk due to restriction to operating function only (no or limited investments) and shorter timeframes (up to 10 years). Tariff set more firmly in contracting process and less subject to negotiation. Investments remain responsibility of the WSA. No competitive procurement required in case of public entity. No good reason for this.	As above. Similar regulatory capacity required. Risks are lower. Benefits are primarily in improved operating efficiency. Is this the key problem?

Table 2: Influence of governance model on tariff and investment decisions

Governance model	Tariff decision	Investment decision	Regulatory issues
1. WSA = WSP	WSA, politically driven	WSA, social demands dominate (likelihood of under investment?)	Regulator is also the operator, how to separate roles within organisation. How to give effect to regulation in context where costs are fuzzy. Political concerns often dominate.
2. WSP = public utility	WSA, negotiated balance between WSA and utility interests.	WSP, but often faced with conflicting demands – social demand from WSA and commercial considerations for utility.	Effective arm-lengths corporate governance; reduce political interference. Appropriate balance between social demands and economic viability. Need to establish basis of economic regulation, for example, rate of return with clearly ring-fenced social obligations.
3. WSP = other public	WSA, its contract, likely to be negotiated.	WSA, likely to be undertaken by other public body, will affect tariffs.	How to ensure good contract in non-competitive contracting environment. Effective enforcement of contract in cases of non-performance.
4. WSP = CBO	WSA, in contract, likely to be fixed for contract period.	WSA, social demands likely to dominate.	Economic regulation likely to play a minor role compared to monitoring and support.
5. WSP = lease	WSA, in contract, through competition, may be negotiated if conditions change.	WSA, lessee may do investments on behalf of WSA. Investments will affect lease cost.	Competitive procurement Effective monitoring Impact of profit incentive
6. WSP = concession	WSP, its contract, through competition initially then by negotiation	WSP, its contract, commercial considerations dominate	Competitive procurement Effective monitoring Appropriate investment demands on part of WSA Impact of profit incentive, foreign exchange risk.

6.2 Building blocks for improved economic regulation in South Africa

6.2.1 Strengthening contract regulation

Capacity. National capacity needs to be strengthened to support the development of good contracts between water services authorities and water services providers (where these are external).

Transparency in contracts. There needs to be greater transparency in these contracts.

Understanding contracts. A much greater understanding needs to be developed with respect to what constitutes best contracting practice (see capacity above).

Enforcement. Greater clarity is needed on the enforcement of (especially public-public) contracts.

6.2.2 Towards utility-type regulation in municipal-run operations

Ring-fencing. Proper financial ring-fencing of water services, including proper accounting for the assets is a *necessary pre-requisite* for economic regulation of water services in South Africa.

Rate of return regulation. Establishing an appropriate rate of return on water services assets when used for "economic purposes" is a good starting point for economic regulation in South Africa.

Separation of "Community Service Obligation" (CSO). In order to implement rate of return regulation, it is necessary to separate out the community service or social obligations of the water services provider. These social obligations are any services which are supplied at less than full economic cost, or services which are supplied for the benefit of the broader community (for example, municipal parks).

Payments for CSO. The costs of the CSO should come from the national tax payer (in the case of universal service obligations determined nationally) and from the local tax payer (in the case of local community service obligations such as municipal parks).

Valuing assets. A standard method for valuing water services assets in South Africa should be developed. The Australian approach of "fair value" should be considered. The fair value of specialised assets are measured at their "market buying power" which is estimated by the replacement cost of the asset's remaining future economic benefits. (This is not necessarily the same as the cost of replacing the asset.) At a basic level this could be measured as the depreciated replacement cost. At a more sophisticated level this could be measured as the depreciated optimised replacement cost. This means that where there is excess capacity, the asset base is optimised (excess capacity removed) to reflect actual service potential that would be replaced.

Depreciation. A standard method for depreciation should be adopted and standard periods used for types of assets appropriately classified. This could be part of GAMAP.

Externalities. The costs of externalities (typically environmental externalities) should be internalised into the costs of the service. These should only be included in allowed costs where actual payments are made (that is, where they *have* been internalised).

Understanding efficiency. A better understanding of how to measure operating efficiencies is needed. This also entails developing measures for quality of service provided.

Strengthening consumer voice. Ways to strengthen consumer voice need to be found. The requirement of customer or consumer charters is an important step forward.

6.3 Policy, legislative and institutional reform

Competitive contracting. Wherever external contracts are entered into, these should be on a competitive basis. There are no good grounds for excluding public agencies from competitive tendering requirements.

Regulation of water boards. As a first step towards improving economic regulation of water services in South Africa, the economic regulation of water boards could be considerably improved and strengthened. Water Board regulation should be moved to a rate of return, with clear ring-fencing of any community service obligations and retail operations.

Incentives for regulatory reform. It is not clear that adequate or appropriate incentives exist at present for institutional and regulatory reform in the water services sector.

Vertical integration. The case for vertical integration of water services providers (even on a selective basis) in South Africa needs to be examined more thoroughly.

6.4 A role for guidelines

There is a role for guidelines for water services authorities on the following topics related to economic regulation:

8. **Ring-fencing.** Give practical guidance on how to go about ring-fencing water services.
9. **Managing assets.** Given guidance on the establishment of an appropriate asset register for water services, including a standard method for valuing assets and defined standard method for depreciation of assets.¹⁰

¹⁰ The WRC research project on asset valuation can be used as a good starting point for this.

10. **Separating economic and social obligations.** Given guidance on how to separate social and community services and obligations from "economic services". Give guidance on how to account for subsidies and grants in a transparent way.
11. **Reporting.** Present a standard reporting format.
12. **Pricing.** Show how prices should be structured and calculated.
13. **Investment decision.** Describe a process for reviewing investment decisions and reporting on investments (as well as defining what constitutes an investment for this purpose).
14. **Guideline for application of economic regulation** to water utilities in South Africa.

Some of these guidelines already exist (at least in draft or rudimentary form.) As part of this project, a *draft guideline (for discussion purposes only)* on the practical application of economic regulation to water services was developed (see Preface).

7. Implementing economic regulation in South Africa ¹¹

7.1 Towards an economic regulation strategy

7.1.1 Understanding the importance of economic regulation

Before economic regulation can be effectively implemented in South Africa, it will be necessary to demonstrate more conclusively the benefits that can arise from the effective application of formal economic regulation in the South African context. A specific study aimed at quantifying the financial and economic benefits accruing from economic regulation of water should be undertaken. This study should do the following:

- Assess the economic performance of the water sector over the past 8 years, focusing on:
 - The financial and economic performance of the water boards (the 2 major water boards and a selection of two or more smaller water boards) over the last 5 years
 - The financial and economic performance of Johannesburg Water since 1 July 2001.
 - The financial and economic performance of Ethekwini, City of Cape Town, Ekurhuleni, Tshwane, Buffalo City, Mangaung, Umsunduzi and Nelson Mandela since 1 July 2001.
 - The effectiveness of "social spending" in the sector since 1994 particularly with respect to sustainability of infrastructure.

¹¹ This section is extracted from the concluding section of the guideline referred in the previous section.

- An assessment of the economic and financial gains that are practically achievable considering actual financial performance in the sector and how this might be influenced by formal economic regulation.
- Give an indication of the scale of operation at which economic regulation becomes feasible and consequently propose an appropriate scale of country spending of regulation. This should be done in terms of a regulatory impact assessment where the costs and benefits of economic regulation (also in terms of scale) are assessed.

7.1.2 Creating a culture of economic regulation

The experience of economic regulation in the electricity industry (as well as the experience of the contracts management unit) suggests that it will take a number of years to effectively implement a formal economic regulatory framework in South Africa. Nevertheless, it is important to get started. Progress will be incremental and will need to take into account capacity constraints. However, the real learning and capacity development will occur through the process of implementing economic regulation and the associated institutional reforms (see section 7.2.1).

7.1.3 First things first

The application of economic regulation should be strategic. Implementation should focus on these areas where the most gains can be made for a given level of effort (both in terms of learning and in terms of actual economic gains from the application of economic regulation). The most obvious starting points for the application of economic regulation are:

- Johannesburg Water (the only truly ring-fence municipal water services provider)¹²; and
- Rand Water and Umgeni (the two most economically significant water boards).

The learning can inform the evolution of the economic regulation strategy and the economic gains demonstrated can help to build a stronger case for the wider application of economic regulation.

7.1.4 Compliance regulation: service standards

Economic regulation must also ensure that compliance with service standards is achieved cost-effectively. Service standards include the reliable provision of service; quality of supply and service; customer satisfaction and resolution of complaints and disputes. There is a direct relationship between the quality of standards imposed and the cost of meeting these standards.

When understanding economic regulation it is important that this be seen not as a parallel process to other areas of regulation (standards, environmental and so forth) but as an integral part of deciding on those standards. A better understanding

¹² Excluding private water service providers providing services in terms of concessions or leases.

between the different areas of "regulation" needs to be developed and ROR regulation, with a focus on allowable and required costs can foster this.

In the case of rate of return regulation there is little incentive to cheat on standards because all costs incurred by the utility for the provision of reliable services, quality supply and customer satisfaction, are allowed in the ROR methodology.

In the case of incentive-based regulation, utilities may have an incentive to cut costs at the expense of meeting service standards. The regulator will have to ensure that quality assurance programmes are undertaken by the regulated entities.

7.1.5 Choosing the method of regulation

Rate of return regulation is the first stage of incentive-based regulation (IBR). It is therefore relatively academic at this stage which methodology is used. IBR has a higher incentive power for efficiency but is also more complex to implement and carries greater risk in the context of market uncertainties. Because of the proposed restructuring of the water services industry (as set out in the national Strategic Framework for Water Services) and the consequent uncertainty within the South African water industry, it is recommended that revenue and price reviews be done on an annual basis rather than in terms of a three to five year cycle. The annual application of economic regulation will also increase learning in the sector and help in the development of capacity. For these reasons, it is recommended that rate of return regulation be implemented initially with a view to evolving towards incentive based regulation. See Guideline for more detailed recommendations.

7.1.6 Developing regulatory capacity

According to Kim & Horn (1999) in addition to the incentives problems, in most developing countries where professional skills are scarce the opportunity cost of scarce human capital devoted to regulation is significant and should also be considered when developing an institutional reform and regulation strategy. These considerations should form part of the study recommendation made in section 7.1.1.

7.1.7 Transition to independent regulation

Ultimately it is probable that effective economic regulation will only be achieved once an independent regulator with adequate capacity has been created. This is a position advocated by the South African Utility Regulator's Association (SAURA). However, it is not likely that an independent regulator for water services will be established in the short term. In this context, there are some intermediate steps that can be adopted with a future transition to independent regulation in mind. These include:

- Establishment of a dedicated regulatory unit within a ministry or department to co-ordinate regulatory activity and to foster the development of technical skills and professional standards;

- Creating a separate agency but retaining decision making with the relevant government ministers (for example, Ministers of Water Affairs and Finance); and
- Creating an autonomous agency with power to make recommendations but retaining final decision making powers (or review powers) with the relevant government ministers (for example, Ministers of Water Affairs and Finance).

For further discussion, see Smith (1997).

7.2 Complementary initiatives

7.2.1 Institutional reform

Probably the most pressing economic issue facing the water services sector is that inadequate resources are being made available for rehabilitation and maintenance of systems. This, together with almost certain inefficient use of existing resources, will result in the collapse of water services infrastructure in the medium term. The most important means of addressing this problem is the institutional reform of the sector with the view to professionalising the water services industry, especially for the major urban centres. The national Strategic Framework for Water Services sets out a policy framework for this reform which should be pursued as a matter of priority.

7.2.2 Regulating subsidies

The decentralization to local government of decision-making with respect to the allocation of capital and operating subsidies poses particular challenges to the water services sector. It is important, from an economic regulatory point of view, to be assured that capital and operating subsidies are being allocated and used efficiently.

The best way of ensuring this is to insist on the proper ring-fencing of water services provision. In this way, formal economic regulation can be conducted and the efficiency of resource use in general, and subsidy use in particular, can be assessed. However, in many cases (particularly for the smaller rural municipalities), it will not be practical to ring-fence water services in this way. Methods to ensure efficient subsidy spending in this context need to be developed.

7.2.3 Regulating contracts with private and public providers

Improving contract regulation is an important complementary initiative to the development and implementation of this guideline. The most immediate priority is to review the Water Services Act and Section 19 regulation in light of the cabinet approved national Strategic Framework for Water Services. In addition to this, additional capacity in the national water services regulator (DWAF) is needed to review all contracts before approval and to assist with contractual amendments and disputes. The economic principles set out in this guideline can be used to inform the regulation of investments and tariffs within contracts.

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ANNEXURE A

**Economic regulation of water services
in Africa – a review**

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1. Introduction

The purpose of this paper is to review experiences in economic or price regulation across Africa, with a view to extracting relevant lessons for South Africa.

The review has been limited to a desk-top survey of available sources, which has resulted in a bias towards contract regulation. Other forms of regulation, namely the regulation of public utilities, and of government bodies as the water service provider, have not received the same amount of attention in the literature as private-sector contracts.

2. Institutional reform and regulation

One of the key drivers of institutional reform in the African water sector has been the need for governments to access finance. International donors and funders have in turn imposed conditions on the provision of funding. These conditions have frequently included the need to privatise the sector or entity which was to benefit from the funding, in order to both increase transparency and efficiency, and provide the investor with some measure of protection.

For this reason, the vast majority of documentation on water regulation in Africa is centred around the regulation of contracts with private providers.

It is generally believed by funders that in the absence of a strong institutional context, increased transparency and competition for the market will help to improve regulation of the water sector. The removal of the enterprise from state control through some form of private sector participation is intended to improve performance by focussing on financial performance, and reducing political interference in service delivery. However as will become apparent from the cases outlined below, a weak institution is unlikely to become a strong regulator, resulting in generally poor economic regulation of private contracts. In many instances the institutional set-up has also compromised the independence of the regulator, who has remained subject to political interference.

The choice of contract type has also been influenced by the assumed disincentives for the private sector in investing in water assets in a developing context. Water assets amortise over very long periods, and have little or no resale value. Investors who want to sell out may have limited ability to dispose of shares. The water sector is also particularly prone to government intervention, due to its public good nature.

These concerns have led to contracts where the commercial risk is either shared between the public and private partners (with resulting problems relating to the allocation of responsibilities, and effective transfer of all risk to the public partner), or assumed by the public partner, in order to make private investment in the water sector more attractive.

In many countries the weak regulatory capacity is exacerbated by limited investor interest. In circumstances where the government has gone to considerable lengths to attract investors and only one or two bids are received, the threat of re-tendering the contract in the event of non-compliance has little credibility.

When discussing the regulation of the private contracts in the cases below, the achievements made under the contract are mentioned, as an indicator of the degree to which operators have been held accountable by the regulatory agencies.

The need for improved transparency and efficiency has also prompted donors to encourage the establishment of regulatory agencies. In many cases they have also stipulated the methods for regulating tariffs.¹

The objectives of regulation have been discussed elsewhere, and will not be explored in any detail in this paper. Suffice to say that regulation is intended to:

- Protect consumers from possible monopoly abuse, whether through excessive prices or poor or unsafe service;
- Protect service providers from possible arbitrary interference that will undermine incentives for investment;
- Promote other social interests, such as environmental protection;
- Promote economic efficiency.

Regulation of water and sanitation services in Africa is carried out by a variety of different bodies. Unfortunately most of the literature on regulation focuses on regulation of private sector contracts, and little has been written on regulation of public water service providers.

In most African countries, regulation remains the responsibility of the government department(s) involved with decision-making in the sector, and very few countries have considered the possibility of introducing independent regulatory agencies. Even countries such as the Ivory Coast which have had private sector contracts since 1959, have not yet introduced independent regulators.

The analysis focuses on a few examples of regulation that are currently in place in Africa, structured according to the types of institutional arrangements which are found currently.

The different types of bodies responsible for economic regulation in Africa include:

- central government department responsible for regulating either or both public and private water service providers, such as in the Ivory Coast;

¹ Specific examples can be seen under the section on the PURC in Ghana.

- a public utility (usually the asset holding company) responsible for some service provision, and also regulates the private operator; such as in Guinea and Senegal;
- an independent sector-specific public regulator is established, which may monitor both private operators and public utilities; such as NWASCO in Zambia.
- an independent multi-utility public regulator, which may monitor and regulate the activities of both private operators and public water utilities. The newly established PURC in Ghana is an example of such an institution.

The main roles of the regulatory bodies in Africa to date include the following:

- Monitoring private sector contracts and ensuring compliance with agreed standards and tariff limits;
- monitoring tariff adjustments, considering both appropriate levels and tariff structures;
- penalizing the private operator (and in a few cases, the public operator) where required;
- setting revised performance standards at regular intervals;
- awarding and cancelling licenses or permits;
- assisting the government with technical or policy issues.²

The regulator's responsibilities with regard to the above might include the ability to decide, or only to advise or recommend.

Price regulation in the African water sector has been based largely on regulation by contract, with price levels set for a fixed number of years in private contracts, or in the case of public operators, by a central government department.³

The cases below explore some of the experiences with economic regulation in Africa to date, followed by a discussion of some of the main lessons to be learnt for South African water regulation.

3. Case-studies

3.1 Government department as regulator

3.1.1 Ivory Coast

Background

² WUP, 2000; World Bank Note, 2000

³ WUP, 2000

Water supply and sanitation services are provided separately in the Ivory Coast, and delivery for both is organised on a national basis. However, in the water supply sector, there is a regional split between those areas supplied by the private operator, SODECI, and those supplied by the public sector.

Since 1959, Abidjan's water system has been run under a lease with a private firm, SODECI. The private firm that owned SODECI was not prepared to take on responsibility for investment because it was not clear that the sector revenue would cover debt service requirements.

In 1987 the contract between the government of Cote d'Ivoire and the private water company, SODECI, was renegotiated. Although Abidjan's system was well run, a crisis in public finances in the mid-1980's made it hard for the government of Ivory Coast to implement the investment required to meet the rapidly expanding demand for water. The World Bank and French government encouraged the government to shift more responsibility for implementation of investments to SODECI who also agreed to reduce tariffs for a number of users.⁴

SODECI made substantial concessions: the authorities managed to negotiate a 20 % reduction in fees with the private operator just by suggesting that they might allow other companies to bid for the contract. This suggests that SODECI had enjoyed substantial rents over the course of the contract.⁵

Prior to 1987, the public sector continued to have sole control over investment decisions, and these were often undertaken without consulting SODECI. At the same time, SODECI was able to retain a protected proportion of revenues that could have been used for investment. Both of these flaws in the system meant that there was a mismatch between investment needs, investments undertaken and revenues, which led, presumably, to a reduced and inefficient investment programme. This problem was addressed in the renegotiated contract, which included a requirement for SODECI to submit investment plans, to administer the funds, and to carry out the construction for works below a fixed value. The company's revenue guarantee was also abolished. The company is still not responsible for financing investments, although it is now involved in investment planning.

SODECI now continues to get a lease fee without being exposed to any risk. The finance for investment and debt service come from the difference between consumer tariffs and SODECI's lease fees. The balance here is transferred to the Fonds de Developpement de l'Eau (FDE) which funds investment expenditure and the Fonds National de l'Eau (FNE) which funds debt service.

⁴ Noll, unpublished

⁵ Bayliss, 2002

Under the contract SODECI is responsible for supplying drinking water services in Abidjan and all other urban centres in the country. This involves production, distribution, service management, facilities and network management and maintenance, renewals and extension of the network, as required by the government, and the collection of tariffs. Since 1997, it has drawn up investment plans that are submitted to the government.

The public sector is the owner of the network and all related assets, and is still the provider of water services to rural consumers. It is also responsible for financing investment, and setting tariffs for consumers.

There is no independent regulatory body for the water supply and sanitation sectors. Regulatory responsibilities for water supply lie primarily with the National Water Directorate.⁶ Regulation involves the monitoring of compliance with the contract, tariff regulation, and the monitoring of investment costs.

Several government bodies are involved with the provision and regulation of water supply and sanitation services in Côte d'Ivoire, including the following:

- The Ministry of Infrastructure Economics. This is the arm of the government that designed, issued and signed the contracts with SODECI.
- The Water Directorate, part of the Ministry of Infrastructure Economics, is the owner of the supply network, and is responsible for monitoring SODECI's compliance with the contract, approving tariff adjustments, and granting approval to some construction projects. It is organised into urban and rural sub-directorates, with the urban sub-directorate having immediate responsibility for the contract with SODECI.
- BNETD monitors the costs incurred by SODECI when undertaking network renewal and extension activities.
- The Ministry of Environment is involved with matters relating to water pollution, drinking water quality and water-resource management. It works closely with other government departments to ensure that objectives of reducing pollution and improving sanitation services are taken into consideration in all economic and political decisions.
- The High Commission for Hydraulics is responsible for water management.

Regulatory performance

Under SODECI, the proportion of the population with access to drinking water has risen, and there have been efficiency improvements. SODECI is able to finance operations and maintenance, service its debts, and provide shareholders with dividends from tariff income.⁷ The connection rate has increased since 1989, water

⁶ The Ministry of Housing and Social Welfare is responsible for regulating sanitation services.

⁷ Noll, unpublished

quality has remained high, UFW is still low and labour productivity continues to improve. The proportion of water billed as a percentage of water produced has increased significantly, indicating improvements in reducing UFW and increased efficiency.

The rate of bill payment in the private sector is high, and there are few incidents of default and disconnection. However there is an ongoing problem with non-payment by the public sector. This problem is intensified as SODECI is unable to cut off public-sector entities for non-payment. As in Guinea, the private operator SODECI does not cut public sector customers off, but rather withholds payments to FDE and FNE, the investment and debt servicing funds. This means that the funds transferred to these two funds are insufficient to cover future investment and debt service needs.

Operating risks are relatively low, even though courts are not independent and the provisions for international dispute arbitration has not proved practical. The company is protected in part because the French government and the World Bank have been willing to assist in clearing up problems between the operator and the Côte d'Ivoire government. For example, in 1997 the French aid agency provided loan funding to the Ivory Coast conditional on tariff adjustments and payment of its water bills. Furthermore, the operator collects all revenues, including funds for the government to use for investment, and it has withheld the funds when government has failed to pay its bills.

The absence of an independent regulator is a potential problem. There is some concern that public authorities may not monitor SODECI sufficiently, perhaps enabling the company to earn above-normal returns. It has been argued that SODECI's willingness to agree to a 20% reduction of fees during the contract renegotiations is proof of the inadequate regulation. While SODECI remains the only private operator in the sector, the absence of a regulator may not be too significant, particularly if the public sector puts in place more transparent and frequent monitoring regimes. If other private operators enter the water supply and/or sanitation sectors, however, the burden on the public authorities to monitor these will be great. There may also be concern about the long-standing relationship between the government and SODECI, resulting in the company being given preferential treatment (for example, in tenders for private contracts). The case for an independent and autonomous regulator for the sector may therefore become more important in the future.

In Cote d'Ivoire there are concerns about the regulator's ability to efficiently monitor SODECI's investment activities. Under the terms of SODECI's contract all projects valued below a certain threshold can be implemented without the need for competitive tenders. The company may then give undue priority to small investments or lose efficiency by dividing large investments into a series of smaller projects and thereby earn excess profits. SODECI's contract does not contain precise performance targets and the company does not submit information on its performance at regular

intervals. SODECI is supposed to submit annual reports about its activities and is supposed to be liable to pay sanctions for failing to meet such performance targets, however the company has not paid penalties.⁸ There are concerns about the ability of the water directorate to effectively monitor SODECI's investment activities to ensure that this is not happening.

Regulation and tariff adjustments come under the water directorate but ultimately they have to be approved by a council of ministers. The process remains highly political and has therefore been more erratic and ad hoc than might have been.

Regulatory institutions to ensure that the operator complies with its obligations under the contract are weak. Four different government bodies, all lacking clear lines of responsibility or political insulation, monitor the private operator. SODECI manages the system, collects all revenues, and undertakes most investments, despite the fact that larger projects are supposed to be competitively bid.

In a workshop participant survey of existing regulators in Africa, the Direction Water Directorate, established in 1974, highlighted institutional issues as being their biggest challenge. So despite having nearly 30 years of experience, the Ivory Coast is still battling to get the regulatory framework right.⁹

3.2 Asset holding company as regulator

3.2.1 Guinea

Background

Prior to water reform in the late 1980's, Guinea had one of the least developed urban water supply sectors in West Africa, with less than 40% of the urban population having access to piped water. In 1989, the government entered into a lease contract for private sector operation of water services in the capital Conakry and 16 other towns. Donor pressure contributed to the decision to involve a private operator in water services.¹⁰

Two new companies were created: a state-owned asset-holding water authority, Societe Nationale des Eaux de Guinee (SONEG) and a water management company, Societe d'Exploitation des Eaux de Guinee (SEEG). SEEG is jointly owned by the state (49%) and a private foreign consortium (51%) formed by the French companies, Compagnie Generale des Eaux and Saur.

The new arrangement involved a set of three contracts between:

⁸ Bayliss, 2001

⁹ World Bank note, 2000

¹⁰ The government was short of funds and needed donor finance. For the World Bank, the poor performance of the first Conakry water supply and sanitation project meant that future finance would require more far-reaching reforms so private participation was a condition of World Bank lending.

- The Government and SONEG;
- SONEG and SEEG and
- SEEG and its international shareholders

SONEG was owned by the government and owned the water supply assets. They were also responsible for setting tariffs, servicing debt, planning & implementing new investments, and monitoring SEEG. The Board consisted of government ministers.

SEEG operated and managed the existing supply system, in addition to billing and collecting revenue in the supply area. They also had to pay a rental fee to SONEG, and do some small-scale investment. SEEG received payments from customers and paid a management fee to the private shareholders, Vivendi and Saur. SEEG also worked for SONEG as a contractor for rehabilitation and extension work.

While this arrangement was attractive to private investors as they assume less risk, and to the government as it was more politically acceptable than privatizing state assets, the drawback is that responsibilities for the sector were confused.

Regulatory Performance

When the lease was introduced, prices did not cover operating costs and depreciation, so it was decided to phase in price increases. Donor funding was made available to cover the subsidy as tariffs were gradually increased, with the subsidy being phased out as tariffs increased. They also went directly to the private firm rather than through the government.¹¹

Since 1989 water services have not improved as much as had been hoped. Connections increased slowly, as the lease did not specify targets, and it was technically difficult to set-up new connections due to the unplanned and rapid growth of the capital, Conakry. System expansion was also slowed by disagreements between SEEG and SONEG over who was responsible for what. Connections have risen from approximately 40% in 1989 to 50% in 1996. Although the exact numbers available disagree, the number of water connections has roughly doubled over the period.¹²

Labour productivity rose at the time of reform from more than 40 to 20 employees per 1000 connections. Water quality and customer service improved, while metering levels rose dramatically from 5% before reform to 98% of private customers and 100% of administration connections.

¹¹ Cowen, 1999

¹² Noll; Cowen, 1999

However these technical improvements did not translate to financial improvements. Unaccounted-for-water remains high at around 50%, as there are no incentives for SEEG to reduce it. There is no water shortage, and the amount paid by SEEG to SONEG is a proportion of bills collected, not of the water used.

Initially bill collection rose, but fell again once tariffs started to escalate, and has remained low. Even though prices were initially subsidized with funds from international aid agencies, they increased sharply from about US\$0.13/kI in 1988 to US\$0.90/kI by 1994. Although small volume consumers are subsidized, affordability became a serious problem even for wealthier consumers. As tariffs rose, so did the incentives for illegal connections. In 1996 58% of private bills went unpaid¹³. While SEEG can and does cut off supplies to (mainly private) consumers who do not pay their bill for three consecutive months, they have not done the same to government users who failed to pay for water usage. Collection rates have remained low as government still does not pay its bills. For the first two years of the lease, under donor pressure, the government paid its bill regularly. But in 1991, the government collection rate fell to less than 50 % and then dropped further to close to 10% in 1993. This is a major problem for SEEG as the government still accounts for about 30% of sales. As in the Ivory Coast, the operator has been keeping the revenues it collected for the government water investment fund to cover these arrears. One reason tariffs are so high is that the costs of a system sized for a larger customer base are spread over so few paying connections. Costs are then passed on to smaller consumers who pay their bills.

SEEG did not disconnect government departments who defaulted, although the contract allowed them to. However the government had significant power over SEEG, as they decided on the tariff increases, so it is likely that SEEG did not want to jeopardize any chances they had of SONEG agreeing to greater tariff increases. This theory is supported by SEEGs willingness to disconnect supplies to local agencies with little say in tariff decisions.

SONEG, the official regulator, has not been able to effectively monitor the contracts due to a lack of autonomy and information asymmetries. The presence of government ministers on the board meant that SONEG was unlikely to avoid political pressures.

To the extent that SONEG allows SEEG to adopt a cost plus tariff setting scheme, then the lease approximates a management contract with SEEG's risks minimised and commercial risk borne by SONEG, despite SEEG's role in investment. Given the improvements in billing and large increases in tariffs, SEEG quickly became profitable. In 1996, SEEG made profits of US\$3.2m. SONEG, the regulator, however made losses in 1996 of US\$4.1m. The decline was due to the drop in the rental fee that SEEG paid to SONEG (which they were holding back to cover government

¹³ Cowen, 1999

defaulters) and the end of the subsidy that the government paid SONEG for debt service.

According to the World Bank an audit discovered that the pricing formulae had been wrongly applied. The misapplication of the formulae that adjust prices in response to cost changes resulted in overvalued tariffs. Because of this and because of the informal price negotiations, the private operator was receiving more than twice the revenue per cubic metre than was originally anticipated. This is the result partly of a lack of administrative capacity at SONEG but also because SEEG has failed to provide the information to SONEG that was required under the contract.

Under the current weak institutional framework there has been no independent body to enforce the contracts between the parties involved in the privatisation. The weak judicial system makes it difficult to collect payments from consumers who refuse to pay, in particular from government institutions.¹⁴ Instead, disagreements between operator and public sector have had to be resolved at the highest levels of government. Such a system has soured relations between government and investors. The government retains substantial discretionary power that is only partly counterbalanced by international lenders and the lobbying of the companies that own SEEG.

SONEG has been unable to force SEEG to comply with its reporting requirements, so it does not have access to information on SEEG's finances. This means that when SEEG puts in a request for SONEG to increase tariffs, SONEG is not able to accurately assess the grounds on which this is based, and if the request is reasonable. If SONEG responds passively to tariff requests, SEEG's commercial risk is reduced. If tariff requests are on a cost-plus basis, commercial risk will end up being borne completely by SONEG.

There is a lack of clear separation between SEEG's activities as an operator, and its activities as service contractor to SONEG for rehabilitation and extension works, which are performed on a cost-plus basis. Even though SEEG is required by contract to provide SONEG with separate reports and accounts on its separate functions (i.e. the functions that are subject to regulation and those that are not), it has failed to do so. This has aggravated the information asymmetry. Without such separation, SEEG might be able to allocate any cost overruns incurred because its operational activities – for which SEEG should bear some commercial risk – to its construction activities for which it does not bear commercial risk¹⁵.

In addition, when SEEG is doing maintenance work contracted by SONEG, there is no requirement for SEEG to put its input procurement to competitive tender because it is assumed that the private firm, aiming to maximise profits will simply go for the

¹⁴ Bayliss, 2001

¹⁵ Bayliss, 2001

best value option although this can be complicated when they source products from their parent company. The problem comes when the private firm sources input from its parent company and there is no way of the government knowing if the firms is using transfer pricing to increase profits

The end result of this lack of disclosure is that more commercial risk is carried by SONEG.

Due to the interrelated functions between SONEG and SEEG, there have been disputes over who is responsible for what. The overlapping of investment responsibilities has caused problems with both blaming the other for delays in extending the network and making new connections. The practice of sharing risks has created a situation where there are no clear commercial incentives for the private partner in its operation and maintenance roles. Risk sharing has been difficult to implement and enforce, resulting in suspicion and hostility between parties the two parties.

The water lease in Guinea reached the end of its ten year duration in 1999. The government has subsequently signed interim one-year lease contracts. However, efforts to negotiate a new 15 year lease contract broke down and the government has asked for World Bank assistance with an interim organisational arrangement and with organising a competitive tender for SEEG.

3.2.2 Senegal

Background

Water supply and sanitation services are organised on a national basis in Senegal. A lease contract was set up between SONES, the state asset-holding company, and Senegalaise des Eaux (SdE), the private operating company, in 1996. Rural water supplies are the responsibility of the government administration, the Ministry of Hydraulics' Department of Waterworks and Sanitation.

After studying the contractual arrangements in Ivory Coast and Guinea, it was decided to establish a lease with concession elements. It was also decided that SONES as the regulator needed to be:

- effective and efficient;
- strong in competence;
- lean in staffing;
- have credible autonomy; and

- work in total synergy with private operator.¹⁶

SdE was awarded the contract after meeting the technical requirements, and was selected as the lowest bidder.

SONES is responsible for owning sector assets, planning and financing investments (except for what is done by SdE) and monitoring SdE activities. SONES was to receive the difference between total consumer tariffs and SdE's remuneration.

There is no independent regulatory body in Senegal for water supply or sanitation services. SONES is responsible for monitoring SdE's activities and ensuring that the private operator meets the terms of the lease agreement.

SdE is responsible for managing the water services of all cities in the country. SdE is 51% owned by SAUR (51%), former staff of SONEES (5%), the state (5%), and national private operators (39%). SdE also has some investment responsibilities with respect to the renewal of the distribution network. For example, it is required to renew 17 km of main per year and undertake 6,000 connections per year. Investments are however primarily the responsibility of SONES, the asset-holding company. Incentives to improve service levels and quality are provided to SdE through performance-based financial incentives in the lease agreement. These are also intended to encourage improved cost efficiency. The cost-recovery target aims to increase the rate from 95% to 97% within three years of the lease, and to retain that rate for the lease period. A network efficiency target of 85% is to be reached within five years.

The earlier public utility Societe Nationale d'Exploitation des Eaux du Senegal (SONEES) was formed in 1971. The poor performance of SONEES contributed to the water reform process that culminated in the creation of SONES and SdE.¹⁷ Part of the reason for setting up SONES as a state holding company was to rally former SONEES employees to the reform process. SONEES had also performed well technically so it was worth maintaining a specialised public entity in the water sector.

Four contracts provide the framework for the urban water sector:

- A concession between the Senegalese State and SONES (management of the water public service delegated to SONES);
- a plan contract between Senegalese State and SONES (objective-oriented contract for the development of the sector);
- an enhanced lease contract between the State, SONES and SdE; and

¹⁶ Gueye, 2003

¹⁷ ONAS took over sanitation responsibilities previously covered by SONEES.

- a performance contract between SONES and SdE.¹⁸

Regulatory Performance

Since the take-over of services in 1996, efficiency has improved, and cost-recovery has become feasible. The aim of the lease was to improve water coverage from 75% to 80% after five years. The current coverage rate, when last reported was 79%. The improvements have been most significant in peri-urban areas and among low-income customers. Service management is significantly better than in the past.

Before reform, the public administration failed to pay any of its bills and cost recovery was a significant problem. Now, however, there is 100% cost recovery from the public sector and 95–97% from private customers. The aim of the lease agreement is to achieve financial equilibrium in the urban water supply sector by the end of 2003, and according to a recent presentation they expect to do at the end of 2003. At present, a financial model is run at the beginning of each year to determine the required increase in tariffs to ensure equilibrium. This increase is limited to 3% per annum. Tariffs are now based on the principle of cost recovery.

Unlike Guinea, public entities do pay their bills, and yearly tariff adjustments have so far been implemented as planned.

Tariff Adjustments

Date	% Increase
July 1995	3%
January 1996	2.5%
January 1997	2.88%
January 1998	2.65%
January 1999	2.94%
March 2000	3.91%
July 2001	4.08%

Note: Although the tariff increases for the last 2 years exceed 3%, the interval between increases was greater than a calendar year.

However, despite improvements, the progress achieved with respect to access to safe drinking water and level of UFW has remained below performance objectives established in 1995. This is due to confusion and tensions which persist in the relations between SONES and SdE. Tensions persisted because of staff resentment due to the transfer of operational responsibilities to private operator. Although detailed contracts were drawn up, a number of uncertainties have led to difficult negotiations between the parties. It has been difficult having separate bodies responsible for investment and maintenance.

¹⁸ Gueye, 2003

One of the greatest disappointments has been in the number of connections. While SdE has met or exceeded their targets for connections for the period 1996 - 2000, in addition to those for renewal/rehabilitation contractual works, canalisation and metering, SONES has not. SONES has met and exceeded their contractual targets for pipes, but have met only 25% of their connection targets. It is not clear why there has been such a delay on the coverage target.

Relations between SdE and the regulator SONES are not helped by the fact that SONES is staffed by employees who had been passed over for a job by the private firm and were being paid less than their former colleagues they are supposed to be regulating.

There have been problems with monitoring, and attaining efficiency targets and cost recovery were experienced in the early years of the lease agreement. SONES was slow to start monitoring SDE's activities, partially because of a lack of understanding of what the objectives and responsibilities involved were. Also, in the first year of the lease agreement, there was a gap of 4% between the efficiency target and that achieved. It is believed that these initial problems have been resolved, and further improvements are expected to emerge in the future. There have been other disputes with regards to the lease agreement, with ongoing negotiation between the parties concerned.

While still problematic, the regulatory experience in Senegal seems to have been much more positive than in Guinea. Part of the reason for this appears to be greater political support for the reform process. Senegal also had the opportunity to learn from the experiences in Guinea and the Ivory Coast, and placed greater effort on clearly defining roles, functions and responsibilities.

3.3 Independent regulator

3.3.1 Zambia

Following the 1994 water reform process in Zambia, responsibility for water and sanitation was devolved to Local Authorities (LAs) and the private sector under the 1997 Water Supply and Sanitation Act. The same act also provided for the Central government to delegate regulatory responsibility to an independent statutory body formally established in 1999, NWASCO. There was a significant delay of 2 years in passing the Water Supply and Sanitation Act in Zambia due to the debate as to whom NAWSCO should report to.¹⁹

Its task is to regulate all water and sanitation services providers in the country for improved efficiency & sustainability. The water sector currently consists of 9 public utilities, 33 local authorities and 6 private water companies. LAs can decide on how

¹⁹ Kampata, 2003

water is to be provided in their jurisdiction, but water services are ultimately regulated by NWASCO.

The 1994 reform process set out to:

- separate out water resource management from water supply & sanitation;
- separate regulatory & executive functions;
- devolve authority to LA's and private enterprises;
- promote full cost recovery through user charges in the long-run, and prevent the diversion of water income to other sectors;
- develop more effective institutions through developing human resources;
- promote the use of more appropriate technologies; and
- ensure that an increased share of the national budget is allocated to the sector.

The reform process recognised the need for responsibilities to be clearly allocated, and the existing shortage of qualified human resources.

Services are provided on a regional (in some cases sub-regional) basis, with local authorities being responsible for service provision in the main. Service providers operate exclusively within a specified boundary. Local authorities have the right to delegate water and sanitation provision to autonomous local bodies and the private sector, but in all cases, assets remain under LA ownership.

NWASCO, the regulator, has also been tasked with ensuring that providers extend services to people in low-income urban areas. It can direct providers to extend services in certain areas. The Water Reform Act empowers NWASCO to establish a Devolution Trust Fund to support Commercial utilities (CUs) established by local authorities. It is intended to be an incentive for CUs to go into peri-urban areas, but it is unclear how this incentive works.

Other regulatory functions for NWASCO include:

- licensing all service providers;
- defining the service area and standards for a utility;
- determining allowable adjustments in water supply and sanitation tariffs (the tariffs are set by each individual utility);
- monitoring service standards;
- protecting customers; and
- imposing sanctions if providers fail to meet agreed standards.

It also regulates the levels of capital expenditure associated with meeting these standards, evaluates efficiency, gives incentives for improved performance and penalises defaulters.

NWASCO has a variety of tools at their disposal. Regulatory mechanisms include the issuing or suspension of licenses, and the use of enforcement notices and penalties where providers do not meet the standards set. Publicity is also expected to act as an incentive, as the ratings of providers will be published, based on their performance in the annual utility performance report.

Providers have to submit business plans to NWASCO, and have to demonstrate improvements in services before any tariff increases can be agreed to. This is intended to avoid service inefficiencies being paid for by consumers.

The main ministries involved are the Ministry of Energy and Water Development (MEWD) and the Ministry of Local Government and Housing. The former is responsible for resource management and is the government body to which NWASCO reports. The provision of services, and relationships with service providers, are the responsibility of the Ministry of Local Government and Housing (MLGH). In particular, the MLGH facilitates resource mobilisation for infrastructure development.

The institutional structure is fairly complicated, due to the spread of water and sanitation functions across several government ministries and organisations. However all are given an opportunity to participate through the NWASCO Council. The Council consists of 7 representatives from key government ministries, 8 private institutions or individuals that have a direct consumer interest in service provision. NWASCO itself consists of 13 staff members, 7 professionals and 6 support staff.

Dispute arbitration is meant to occur through the MEWD and the High Courts.

NWASCO has a large degree of autonomy, as it is a statutory rather than a ministerial body. It is financed through fees of 1% on provider turnover, and staff are paid at private sector rates in recognition of the need to attract skilled staff. It reports to the government through MEWD.

According to its policy documents, NWASCO also sees itself as a potential lobbying body which can leverage incentives for operators servicing the urban poor, such as lobbying government for tax incentives. It is also meant to be an advisory body to assist government in structuring contracts with the private sector, and helping politicians to understand issues affecting the sector.

Problems identified by NWASCO as their biggest challenge at a workshop participant survey:

- Ensuring that licensing fees are paid, which the regulator relies on for financing their operations;

- Existing regulatory expertise is minimal, and capacity still needs to be built;
- Appropriate tools to monitor and enforce regulations still need to be developed.

Despite the fact that much of the regulatory framework has been put in place, it remains to be seen if NWASCO is able to regulate the sector effectively, due to the financial and capacity constraints already identified by them.

No information has been found to assess NWASCO's performance with regard to regulation since 2000. However they have responded innovatively to some challenges. For example, tariff levels were low in the past, with local politicians being reluctant to agree to large incremental changes in prices. This made it particularly difficult to extend services, with some element of subsidisation, to low-income customers. As a result NWASCO is trying to ensure that operators do not choose their service areas, thereby ignoring the most needy areas, by defining service area boundaries accordingly. They are also trying to create incentives for providers to provide service where they are most needed.

The reform process has helped to clarify roles somewhat, and to improve co-ordination between the major players in the sector. The water reform process has enjoyed support and direction from high levels of government. It remains to be seen if the same level of support will be given to the issue of cost-recovery in the water sector.

3.4 Multi-Sector regulator

3.4.1 Ghana

Urban and rural water supply and sanitation services in Ghana are currently provided by the state-owned Ghana Water and Sewerage Corporation (GWSC). Since 1995, however, the government has been working towards reforming the sector, involving both institutional change and introducing private sector participation in the water supply sector. Reform was considered necessary by the government in order to improve the availability of safe and affordable water supply to low-income areas, levels of service and operational efficiency. The government is trying to move away from being an operator, to either a partner in water provision, or an enabler and regulator.

The proposed restructuring of the urban water sector into 2 separate business units, originally conceived as enhanced lease contracts, has been very contentious. Under this process, GWC will remain as the asset-holding company, responsible for sector financing and investment, while operations, maintenance and revenue collection will be the responsibility of the private operators. The pre-qualification phase was completed in 1998, and there have been concerns that the short-list did not include any local firms. There have been changes to the original contracts in one of the areas however, which has resulted in delays.

The implementation of the reform has also been delayed by the lobbying by GWSC, who while in favour of securing more private funding for resource management, would have preferred to retain more of a role in distribution. However, this option was opposed by many involved with the reform, due to concerns over GWSC's poor past performance in distribution. The reform was intended to improve efficiency and financial viability of the water sector.

The Public Utilities Regulatory Commission (PURC), established in 1998, is an independent body established under a government act. Their task is to regulate and oversee the provision of utility services in the country. Currently they regulate only the electricity and water sectors.

The Commission is made up of nine members and includes a Chairman, an Executive Secretary, an institutional representative each for Labour, Industry, and domestic consumers, as well as 4 experts in various aspects of the Commission's work. The Commissioners are appointed by the President in consultation with the Council of State for five-year terms, which are renewable. The Commission is supported by a Secretariat headed by the Executive Secretary.

In summary, PURC's key tasks are to:

- provide guidelines for rates to be charged for the provision of utility services
- examine and approve water and electricity tariffs;
- protect the interest of both consumers and providers of utility services;
- monitor and enforce standards of performance for provision of utility services;
- promote fair competition among public utilities;
- to receive and investigate complaints and settle disputes between consumers and public utilities; and
- to advise any person or authority in respect of any public utility.

The GWSC is to be downsized into an asset-holding company, Ghana Water Corporation (GWC), which is meant to assist the regulator in monitoring the private operators. Performance targets will be set to ensure that the public asset owner operates efficiently and effectively. However there are doubts about the ability of the GWSC to provide credible cost information, due to their own poor performance.

The legislative framework that provides the regulatory mandate of the PURC is allegedly weak, both in relation to consumer protection and to general oversight of the utilities.

The PURC says that it operates under a philosophy of self-auditing by regulated utilities, on the theory that the utilities are in the best position to provide information

about their water quality and operations. However, self-audits are extremely controversial and, internationally, have been shown not to protect consumers.

Loan conditions from both multilateral and bilateral creditors have focused on increased cost recovery and privatization. These include the following water sector reform conditions in IMF and World Bank loans to Ghana:

B February 2002, International Monetary Fund, Poverty Reduction and Growth Facility Loan, fifth tranche. This loan includes conditions requiring the "early implementation of the Public Utilities Regulatory Commission's plan for full cost recovery in the public utilities, with automatic tariff adjustment formula for electricity and water."²⁰

C. July 2001, World Bank, Third Economic Reform Support Operation Credit for Ghana. This loan includes a wide range of prior actions. These are actions that the Government of Ghana must complete prior to the approval of the World Bank loan. Prior actions include "increasing electricity and water tariffs by 96 percent and 95 percent, respectively, to cover operating costs, effective May 2001."

The British Department for International Development (DFID) has delayed a loan of US \$10 million for rehabilitation of the water system in Kumasi. The loan was conditioned upon progress in water privatisation in Ghana, and citing slow progress in this area and a shifting of DFID priorities from direct funding of projects, the loan was delayed."²¹

PURC does not issue any licenses to operators.

The main regulatory instruments are the application of negotiated price caps for the energy and water, the intention being to protect consumers from high tariffs, while allowing investors to obtain a reasonable return on their investment. PURC is currently applying a price-cap regulation approach in setting electricity tariffs. In the case of water, PURC uses a modified approach but with the same principles of appropriate rate of return on investment, taking into account affordability for certain consumer groups, cost recovery and financial viability.

PURC is expected to monitor standards of performance by public utilities. They are also directly involved in setting prices and regulating profits for energy and water providers. When negotiating tariffs, PURC is expected to take into account:

- consumer interest;

²⁰ Automatic tariff adjustment formulae require that tariffs reflect shifts in the international exchange rate of the cedi. In other words, consumer rates go up when the value of the cedi depreciates in international markets. This is a common requirement of multinational corporations who want to be shielded from the effects of shifts in soft currency exchange rates when they invest in developing countries.

²¹ ISODEC, 2002

- investor interest;
- the cost of production of the service; and
- assurance of the financial integrity of the public utility;
- economic development of the country;
- best use of natural resources;
- uniformity of prices throughout the country;
- competition among utility companies.

In particular PURC must determine whether costs provided by public utility providers are justified. The current institutional circumstances make it difficult for PURC to determine acceptable and practical operating standards, so tariffs are set largely through an iterative process based on cost information provided by GWC. There is currently very little independent assessment of these by PURC. This is seen as one of the major weaknesses of the regulator, who relies on the inefficient and poorly regarded GWC to provide an understanding of water costs.

A major weakness of the current system is the lack of attention paid to the amount of information required by the regulator in order to regulate effectively. There are few credible sources of information in the industry. This has made it very difficult for PURC to obtain useful information on the production and distribution of water, when preparing guidelines for setting water tariffs.

PURC recently approved a 2-step increase of 40% effective from August 2002 for the Ghana Water Company, who had actually requested a 77% increase. There was public outrage at the size of the increase, but in PURC's view the fact that the increases were done in stages reflected its efforts to protect consumers from the increases that had to take place in order to cover costs in an efficient manner.

In response to the public uproar about the steep increases, the government has made statements that PURC acted improperly in making the decision to announce increases. On the other hand, the GWC utility is complaining about getting a much lower increase than it requested, which it argues is required to have an efficient service.

The government has undermined the authority of PURC and the credibility of the regulatory processes, by questioning the decision on the basis of inadequate consultation between the PURC and the government on the issue. One criticism of this reaction is that government has ample opportunity to comment on the tariff proposals, through the provisions set out in the Act.

The representation of other groups on PURC has also not prevented these same groups from objecting to the recent tariffs.

In terms of autonomy and independence, the Act states that "the Commission shall not be subject to the direction or control of any person or authority in the performance of its functions".²² The most important checks on the authority of this commission is the appointment of its board and management by the President and its financing from funds approved by Parliament.

Enforcement of PURC's decision may be done through the courts, but there is a concern that the judicial system is already overburdened, and will lead to unreasonably long delays in resolving disputes.

PURC is funded by government, through allocations made in the national budget. However PURC is finding this inadequate, and has requested that a fund be raised from the utilities as a charge for regulatory costs. This is also seen as an important step in securing its financial independence. PURC's funding constraints have meant that it still has over 30% vacancies unfilled in the professional categories, affecting both the energy and water sectors.

PURC is required "to conduct studies relating to economy and efficiency of public utilities", and have set up research bodies that will undertake these functions, either by themselves, or through consultants. While the PURC does have capacity problems, it has carried out some review activities that have been applied in the revision of rates for the utilities. Its annual reports have included sections that deal with the financial impact of tariffs on utility companies as well as the impact of tariffs on energy-intensive industries. They have also commissioned independent studies on the socio-economic impact of water rates on different households.

Donors have played a major role in the establishment of the PURC, and also in the ongoing development of staff. While the influence of donors in getting regulation to occur has been significant, it is unclear how much political support there is for PURC and its activities. PURC has not been involved in the highly political discussions regarding the restructuring of the water industry.

The PURC at a recent workshop highlighted capacity building and securing independent sources of funding as their biggest challenges.

4. Findings

Contract regulation

The efficacy of contract regulation depends on the details of the contract, the capacity of the regulator, the competitive pressures that can be brought to bear and the relative negotiating strengths of each party. Pure concession contracts with full risk transfer are relatively rare in the water sector in Africa.

²² Aryeetey, 2002

Regulation of public water utilities

The performance of government regulation of public water utilities in Africa is very mixed. In many cases there is a high degree of political interference (on the location and type of investments, for example) and strong pressures to keep prices below true economic and financial costs. Most commentators recommend an independent regulator in this context.

Regulation of an asset holding company and of a lessee

This arrangement is more common in Africa. It can work well provided the asset holding authority acts as a strong and competent counterpart to the lessee. However in the case studies the asset holding company is not an effective regulator of the lessee, and the company themselves are not subject to adequate or formal regulation. In this case there is general agreement that an independent regulator who can regulate both the lessee, the asset-holding company and the relationship between the two, is desirable.

Regulation of government as a WSP

There is generally a lack of regulation of government as a water service provider. Very little has been written on this situation. However, there is broad consensus that effective regulation in this context is very difficult to achieve and unlikely to occur. Where this seems to be occurring, such as in Zambia, it is still too early to assess how effective this regulation is proving to be.

Unclear allocation of responsibilities

Regulation of contracts has been hampered by poorly defined and unclear responsibilities, and subsequent ongoing negotiations to resolve these disputes. The result of these disputes is to delay progress with meeting targets.

In the lease contracts described above, the government has to work closely with the private operator both to oversee the company's operations and to carry out investment and maintenance in the water sector. Where this relationship is uncooperative, monitoring and investment activities suffer. Both Guinea and Senegal have experienced problems with poor coordination between the operational and investment activities as well as disputes over the exact scope of maintenance and investment responsibilities and lack of accountability for overall performance.

With the privatisation in Guinea, for example, it was assumed that no investor would want to take on investment and debt service risk so a lease contract was adopted where SEEG took on responsibility for operation and maintenance and renewal of small pipes. The risk exposure for SEEG was further reduced by the weak regulatory capacity of the government as the company has been able to increase its remuneration, for example to cover increases in costs, with little pressure to account for rises.

Weak regulation and lack of capacity

There seems to generally be a lack of capacity to accurately assess requests for tariff increases, and to force operators to supply the required information.

One of the key lessons is that where the regulator lacks capacity to monitor and enforce contracts, the factors to be monitored should be as simple as possible.

Regulatory tools

In general there has been very little experience with explicit economic regulation of water services in Africa. Due perhaps partly to the political nature of the service, and partly to the nature of the service, regulation is less developed in water services than in other sectors such as telecommunications and electricity.

What tariff regulation there has been has tended to be based on the use of principles such as cost-recovery and affordability, rather than the use of formal regulatory tools such as Rate-of-Return or Price-cap pricing. Information regarding costs is generally too poor to allow these methods of regulation, and the capacity of the regulator to assess the reliability of information given to them by the operator is generally weak.

Lack of independence

The failure of operators to disconnect government departments who failed to pay their bills, serves to highlight the lack of independence of certain regulatory bodies. The providers were unlikely to disconnect any departments with connections to the organisation they were asking to agree to tariff increases!

Another problem with regulatory independence is perhaps the imposition of regulatory mechanisms by donor agencies. According to Noll *et al*

"Water supply has ... key features that strongly affect the choice of the best performing organization of the market. (...The costs, availability, and quality of water resources vary substantially according to locality, leading to major differences in appropriate market structure, regulatory institutions, and price rules.... (W)ater use causes important health and environmental externalities that frequently are very difficult to internalize or to regulate efficiently."

In their desire to access loan funding, regulatory frameworks are often developed as a by-product of increased private participation. While donors have frequently required the introduction of automatic tariff adjustments, in reality, regulators do not currently have sufficient information or capacity to pick a price adjustment formula that accurately reflects operational costs.

Cost of regulation

No mention has been found in the material regarding the costs of regulation, other than the general cost and difficulty of accessing the information required to regulate providers effectively.

The importance of political support

Contract formation, and indeed the formation of regulatory bodies, has largely been driven by political reforms, and conditionality imposed by international funding agencies. Regulatory frameworks have therefore not been structured well. The recent reform process and subsequent restructuring in Zambia appears to be different in that the water reform process enjoys high-level government support, as opposed to being donor driven. It remains to be seen if the pursuit of cost-recovery enjoys the same amount of political support.

The experience in Senegal has demonstrated the importance of political will and support in implementing reforms. While prior to the implementation of the contract government bills were largely unpaid, payment levels currently stand at 100%. The credibility of the regulator is undermined if it fails to get government cooperation.

5. Lessons for South Africa

Some key lessons arising from the review of the African experience of regulation include the following:

- **A suitable legal and institutional framework.** The potential effectiveness of regulation is strongly linked to the institutional arrangements which can either hamper or promote effective regulation.;
- **Independence.** A key advantage of setting up an independent regulator is the greater transparency achieved. If appropriate skills are available, a multi-utility regulator might help to capitalize on scarce human resources, and promote learning between sectors. This would also reduce the risk of regulatory capture.
- **Separation of roles.** While there is a general consensus on the desirability to separate operating activities from regulatory activities, in practice this separation is not easily achieved.
- **Clear role definition for the regulator.** The roles and responsibilities of the regulator need to be clearly defined, with clear objectives. The regulator should focus on price levels, operational efficiency and the quality of services provided;
- **Power.** Notwithstanding the establishment of an independent regulator, regulatory performance can be compromised by institutional outcomes which seek to retain real power in other institutions. In other words, the establishment of an independent regulator does not guarantee success. The government agency currently responsible for the sector must be willing to handover control to the regulator.
- **Capacity.** Capacity to regulate effectively is in short supply in many African countries and it is important that the institutional and regulatory framework take cognizance of this. The required human capacity must be developed in order to undertake effective regulation.

- **Clear dispute and conflict resolution mechanisms** must be established, that have the capacity and the authority to make binding recommendations/decisions on all parties, including government.
- **Credibility.** The regulator must be seen to be impartial, and to have the ability to perform its functions, and impose penalties where required.

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ANNEXURE B

**Economic regulation of water services
In Australia – a review**

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1. Introduction

The purpose of this report is to discuss the driving factors behind the extensive regulatory reform which has taken place in the Australian water sector over the past decade. It will explore the process of reform in economic regulation in Australia, with reference to a range of different institutional forms, from utilities to local water authorities. The progress made to date in implementing the reforms throughout Australian States and Territories is also discussed.

While the paper will introduce some of the preferred methods and tools of economic regulation which are currently being used and promoted in Australia, they will not be discussed in any detail. These tools are discussed in a separate report (see Preface).

This case-study has been undertaken on the basis on desk-top research, relying primarily on material available on the internet from Australian agencies and government departments, and supplemented by various international journals.

2. Drivers of regulatory reform

2.1 Background

Australia is now firmly engaged in a wide ranging process of water reform directed towards promoting economic efficiency in water use in a competitive environment, within the context of ecologically sustainable management of the resource. The primary instruments driving the reform process are the agreed targets set by the Council of Australian Governments and the provisions of the National Competition Policy. It should be noted that these are mandated policy determinations, not mere recommendations. Substantial payments to the states from the Federal Government are contingent upon the implementation of the reforms. Neither the COAG directives nor the competition policy reforms are negotiable, if the responsible state authority wishes to retain its share of the contingency payments.¹

Australia's water sector has been undergoing reform since the 1980s, with recognition of the need for significant policy and institutional change in order to address the state of the country's water resources. The findings of the Brundtland Commission in the 1980s were given much prominence in Australia, and the World Conservation Strategy was endorsed at the national level. The reform process was given renewed impetus by the World Summit in Rio in 1992.

Numerous Australian reports and policy documents focused on the widespread degradation of the water resource, which was having an impact on the quality and quantity of the water resource. While there were frameworks in place to address the

¹ Pigram, 1998.

natural resource management challenges, these policies were not adequate to halting the process of degradation. It had reached the stage where an intensive management effort was required to arrest degradation. There were also changes in attitude regarding the value of water. As the world's driest continent, conserving water was, and is, a high priority. Australia's water supply exceeds that of most other countries in per person terms, but it also has a high level of water consumption per person. Moreover, water supplies are not abundant in the areas of highest demand. The pressure on demand and insufficient regard for the environmental impacts of water use has led to widespread and extensive degradation and depletion of Australia's water resources. It has been increasingly difficult to identify ecologically sustainable and cost-effective sites for harnessing additional water resources.

According to the National Competition Council, water is one of Australia's largest industries, and in value added terms, is more than one quarter the size of the manufacturing and the agricultural sectors, almost half the size of the electricity industry and three times the size of the gas industry.² Due to the size of the water industry, the sustainability and health of Australia's water resources was recognised as being fundamental to Australia's future economic development. It was also recognised that the underlying policies relating to water pricing, water rights and the institutional arrangements impacting on water management did not provide the right incentives for water to be used efficiently.

Water reform has also taken place in the context of wider policy shifts about the role of government and the public sector in resource management. At the same time that calls were being made for smaller government and a decreased role for the public sector, there was increased competition for limited public funds. There was increased scope for private sector involvement in the water sector, and a trend towards corporatisation of major water authorities. The introduction of greater competition in the water sector has given rise to new challenges and provided another reason for reforming regulation.

The existing regulatory structure was insufficient, as it did not create appropriate incentives for utilities to increase cost efficiency, and "neither allowed nor encouraged the adoption of more efficient pricing structures....Often the pricing structure also failed to achieve full cost recovery."³ The move towards corporatisation which began in the 1980's in the form of organisational and management structures also invited changes in the form and structure of regulation. While corporatisation reduced the scope for political interference and called for the separation of operational and regulatory functions, placing responsibility for the latter in an independent body, it also resulted in the need to prevent the exercise of

² NCC, 2002

³ Albon, 2000

monopoly power on the part of the newly corporatised utilities. There was a move towards more indirect and incentive-based regulatory forms. A feature of Australian utility reform has been a move towards independent regulators that see themselves as independent of both government and the utilities they regulate.

Recent regulatory reform in Australia has therefore been driven primarily by concerns over economic competitiveness, the scarcity of water, the expense of securing new water supplies, and recognition of the need to improve the efficiency of water usage.

2.2 1994 Council of Australian Governments (CoAG) Strategic Framework for Water Reform

Although under the National Constitution water resources management lies with the different States and Territories, the need for a common approach was recognised. It was acknowledged that the problems associated with natural resource management are often too complex to be tackled by one government. Water reform was occurring, but a co-ordinated approach was required to provide greater focus. In 1994, concern over the serious deficiencies in water use and management and the associated degradation of the resource base culminated in all State and Territory Governments agreeing to a package of reforms to the nation's water industry, known as the CoAG Agreement on a Strategic Framework for Water Reform. The new policy was developed in consultation with ARMCANZ, the Agriculture and Resource management council of Australia and New Zealand⁴. The basic objective of the Framework is to produce an economically viable and ecologically sustainable water industry. If successful, the focus will have moved away from increasing the quantity of water available and towards the improved efficiency of water use and the better management of Australia's water resources.

The urban water reforms include:

- the promotion of consumption-based pricing to discourage wasteful water use;
- the pursuit of full cost recovery by water service providers in order to help fund investment in infrastructure, and;
- Institutional changes to ensure water providers are efficient and accountable for the quality and cost of water and sewerage services.

⁴ ARMCANZ is a government forum for consultation, coordination and integration on agricultural, land, rural and urban water issues. They have made it possible to implement reforms nationally. Their terms of reference include the promotion and adoption of a uniform policy on external marketing and water pricing. Final decisions remain with individual cabinets of member governments, but members are ministers of different states and territories.

The COAG rural water reforms are intended to address damage to rivers and groundwater resources and the salinity problems caused by unsustainable water allocations to irrigation. The rural reforms aim to ensure:

- adequate water for the environment;
- water infrastructure that is efficiently developed and maintained;
- that construction of new dams is limited to those that are economically viable and ecologically sustainable; and
- the introduction of a system of tradeable water rights to help ensure that water is used where it is most valued.

Apart from pricing and institutional reform, the framework also involves the clarification of property rights, the allocation of water, public consultation and participation. The Strategic framework was reinforced in April 1995 by COAG's endorsement of the Second Report of the Working Group on Water Resource Policy. The Expert Group released a report on asset valuation methods and cost-recovery definitions, to provide common guidelines for the economic regulation of the water industry across the various States and Territories. The key recommendations of this Expert Group will be discussed below.

2.2.1 The motivation for pricing reforms

Pricing approaches prior to the reforms were inequitable due to the presence of cross-subsidies which disadvantaged industrial and commercial water customers. It was reported that in one jurisdiction the value of this cross subsidy was A\$300 million per annum, (approximately 7% of the total revenue generated by water services in the largest urban areas)⁵. Pricing approaches were based on property values and did not take account of different patterns of use. As a result there was little incentive to use water efficiently. There were also problems with the management of water services, with some providers generating excessive rates of return, while others were not able to adequately maintain water infrastructure.

In rural areas low prices meant that there was insufficient provision for major asset maintenance and refurbishment needs. The Industry Commission estimated that in rural New South Wales (NSW) prices would have to increase by over 50% in order to achieve a non-negative return on capital. If full costs, including capital replacement costs and a 5% return on assets were to be achieved, charges would have had to rise by 250%.⁶ Inconsistent price setting and approaches to asset valuation and

⁵ NCP, 2002. The provision of water and wastewater services to the largest urban areas in Australia produced \$4.6 billion in revenue in 2000-01 and \$792 million in dividends for the government owners of the service providers.

⁶ NCP, 2002

cost-recovery between districts also resulted in regional inequalities, and adverse resource allocation outcomes, which in turn had negative effects on both national and regional economies. For example, in 1995 water charges in Victoria on the NSW border were almost 4 times those of charges in NSW. The presence of capital subsidies in otherwise uneconomic projects also resulted in greater fragmentation of the water industry. In Victoria, subsidies for non-metro water providers meant that small towns had little incentive to seek service provision from larger authorities in the area, thereby achieving economies of scale.⁷

Despite the fact that water resource policy is, according to the constitution, the domain of the individual States and Territories, there was a clear need for a common approach to pricing in the water sector, for both environmental and economic reasons. The pricing principles agreed to by the CoAG in 1994 included the following:

- *Consumption based pricing* was to be introduced in place of pricing approaches based on property values. A two component charge incorporating an access component together with a usage component was to be implemented where cost-effective. Up to this point, all jurisdictions with the exception of the ACT and Northern Territory, generally used property valuations as a basis for water and wastewater charges in urban areas.
- *Full cost recovery*, including real rate of return earned by suppliers, with a limit on rates of return was to be implemented by 1998 for urban water services and 2001 for rural water supplies. This is intended to ensure sufficient provision for major asset maintenance and refurbishment needs in rural areas. Rural water schemes were coming up for refurbishment, and no provision had been made.
- The *elimination of cross subsidies* as far as possible, and their exposure where they exist. Where service providers are required to provide water services to classes of consumers at less than full cost, the cost of this must be fully disclosed and ideally be paid to the service deliverer as a community service obligation (CSO) by the government.
- The pursuit of *positive real rates of return* on the written-down replacement costs of assets.
- *Investment in new rural water schemes*. Future investment in new schemes or extensions to existing schemes is to be undertaken only after appraisal indicates it is economically viable and ecologically sustainable.
- *Cost recovery that includes environmental costs and the costs of asset consumption*, as well as taking the cost of capital into account. Below-cost pricing of rural water produced resource allocation inefficiencies and wasteful

⁷ NCP, 2002

water use, aggravating environmental damage. Inadequate pricing also meant insufficient financial provision for major asset maintenance and refurbishment.

- Where trading in water occurs across state borders, pricing and asset valuation arrangements must be consistent.
- *Efficient delivery of water services.* Service delivery should be undertaken on a commercial basis and according to international best practice. The performance of the different water service agencies would be compared.
- The promotion of a *commercial focus* for service providers in metropolitan areas. In terms of the institutional requirement for a commercially focussed water service provider, the principles explicitly leave it to the discretion of each State and Territory government to choose from contracting out, corporatisation or privatisation.

2.2.2 Structure of the Australian water industry, and institutional reform under COAG

The water and wastewater sector in Australia consists of over 300 utilities, which are almost entirely publicly owned. Most of the utilities serve populations of a few thousand people, while some serve over a million.

Institutional reform was another key component of the COAG Agreement, in response to a lack of clear definition concerning the role and responsibilities of a number of institutions involved in the industry. Previous arrangements for the provision and management of water resources had been predominantly through Government agencies in monopoly positions and often with many of these functions carried out by the same entity. It was not uncommon, for example, for the water provider to also be the regulator, standard setter and resource manager. It was recognised that the existing regulatory structure, based on direct and prescriptive regulation, frequently combining regulatory and operating functions within the same department, and making use of direct ministerial control, needed to change.

According to the COAG Agreement, as far as possible the roles of water resource management, standard setting and regulatory enforcement and service provision were to be separated institutionally, with each role undertaken by separate agencies, some of which may be private. This was to occur no later than 1998. (By 2002, most states had established independent regulators and introduced the required institutional reforms.)

2.3 COAG National Competition Policy (NCP) and related reforms of 1995

According to the Australian constitution, responsibility for Australian water and wastewater services lies with State and Territory governments. Therefore economic regulation of the water industry was state based, and prior to the introduction of the

COAG reforms, this had resulted in a variety of regulation approaches. Although it remains fragmented, Australian water regulation has fallen under the National Competition Policy (NCP) since 1995, as it incorporates the COAG Agreement on Water Sector Reform, as discussed above. The NCP ensures that there is a common and consistent aim, and broadly promotes commercial approaches to service provision, while leaving detailed implementation to each State.

An important part of NCP was to make the operation of all government owned enterprises subject to commercial regulation. This meant that the utilities were now operating under the jurisdiction of the Australian Competition and Consumer Commission (ACCC) and the Trade Practices Act, and the Crown was no longer protected from prosecution for government owned enterprises.

In return for the States agreeing to reform their utility industries in line with the NCP, the Commonwealth agreed to compensate them financially for the loss of revenue. These payments were an important means of ensuring that NCP Reforms, including water industry reforms, were implemented. The National Competition Council (NCC) was given the task of monitoring the progress of the reforms and making recommendations regarding the compensation payments.

This agreement focuses on state-owned utilities, and therefore local government water providers were not included, although they are service providers in Queensland, rural NSW and Tasmania. Municipal level regulation will be discussed further below.

The rationale for the NCP is that competition has the potential to boost economic performance and enhance consumer welfare. In 1995, all Australian governments agreed to implement a series of initiatives designed to improve the competitiveness of the national economy, with the aim of:

- improving living standards for the community at large;
- increasing employment;
- increasing the skills of people;
- supporting economic and industry growth; and
- improving productivity performance through the more efficient use of resources.

This was facilitated by three agreements, namely the Competition Principles Agreement; the Conduct Code Agreement; and the Agreement to Implement the National Competition Policy and Related Reforms. Three aspects of competition policy are relevant to pricing principles for local water authorities, namely:

- recommendations regarding the separation of regulatory functions from business operations;

- the introduction of the principle of "competitive neutrality"⁸ into the provision of water supply services; and
- the nature of competition implied by the Competition Principles Agreement for local government monopoly businesses such as local water authorities, and in particular the principle independent pricing oversight of government business enterprises.

The COAG agreement on NCP provides further support for structural reform in order to separate the non-contestable regulatory functions of a monopoly from commercial activities, which can be subject to competition. Before the potential for competition of any form can be introduced, any regulatory powers held by an operator over existing or potential competitors must be removed. This would for example prevent the local water authority, in its capacity as a regulator, from setting policies or imposing fines or taxes that would benefit its own established local water services provider to the detriment of (potentially) competing firms. Where general councils also run water services operations, the regulatory planning powers of councils and water services operations remain to some extent under one institutional roof. In this case, the NCP suggests that clear walls should separate business activities from regulatory activity.

An integral component of the NCP was to make the operation of all government owned enterprises subject to the disciplines of commercial regulation. The States agreed to reform their utility industries in line with the NCP, while the commonwealth agreed to provide financial compensation for the loss of revenue. The National Competition Commission (NCC) was given the task of monitoring the progress of the reforms and making recommendations regarding the compensation payments. Officially the NCC were to perform their third and final assessment in 2001, and there is no formal indication of any national involvement in the reform process beyond 2001.⁹

3. COAG pricing regulation guidelines

In 1995 the Second Report of the Working Group on Water Resource Policy was released, along with the Report of the Expert Group on Asset Valuation Methods and Cost-Recovery Definitions for the Australian Water Industry. The latter outlines preferred approaches to the valuation of assets, recognition of costs and pricing to ensure that water charges reflect the true economic (including environmental) costs of water service provision. This was endorsed by ARMCANZ, the Agriculture and Resource Management Council of Australia and New Zealand in 1998.

⁸ The objective of this principle is to ensure government businesses do not distort the efficient use of the economy's resources through any competitive advantages as a result of being government owned. (NCC, 2002)

⁹ World Bank, 2000.

It was agreed that given the different circumstances faced by different service providers there is no one best way of achieving cost recovery. A prescriptive approach may also lead to unintended consequences in pricing. Flexibility was therefore built in by providing a pricing band – at the bottom end, full cost recovery means that water businesses must recover operating, maintenance and admin costs, cover future refurbishment and pay appropriate taxes and interest charges, while the top is aimed at limiting monopoly pricing. Responsibility for setting prices was also placed with state regulators or their equivalent, to enable the circumstances peculiar to each water service provider to be taken into account when setting prices within the agreed band.

Guidelines from the Strategic Framework and Related Recommendations in Section 12 of the Expert Group

1. Prices will be set by the nominated jurisdictional regulators who, in examining full cost recovery as an input to price determinations, should have regard to the principles set out below.
2. The deprival value methodology should be used for asset valuation unless a specific circumstance justifies another method.¹⁰
3. An annuity approach should be used to determine the medium to long term cash requirements for asset replacement/refurbishment where it is desired that the service delivery capacity be maintained.
4. *To avoid monopoly rents*, a water business should not recover more than the operational, maintenance and administrative costs, externalities, taxes or TERs (tax equivalent regime), provision for the cost of asset consumption and cost of capital, the latter being calculated using a WACC.
5. *To be viable*, a water business should recover, at least, the operational, maintenance and admin costs, externalities, taxes or TERs, the interest cost on debt, dividends (if any) and make provision for future asset refurbishment/replacement. Dividends should be set at a level that reflects commercial realities and stimulates a competitive market outcome.
6. In applying 4 and 5 above, economic regulators should determine the level of revenue for a water business based on efficient resource pricing¹¹ and (efficient) business costs. Specific circumstances may justify transition arrangements to that level.
7. In determining prices, transparency is required in the treatment of community service obligations, contributed assets, the opening value of assets,

¹⁰ "The deprival value methodology is simply a set of rules for applying different asset valuation techniques based on the circumstances applying". (Tasmanian Guidelines, 2003)

¹¹ Efficient resource pricing includes the need to use pricing to send the correct economic signals to consumers on the high cost of extending water supply systems. As an extension approaches, the usage component will ideally be based on the long-run marginal costs so that the correct pricing signals are sent. (NCC, 1998)

4. Progress in implementation

The linking of the April 1995 COAG agreements and the implementation of water industry reforms to NCP payments played an important role in ensuring that progress occurred. While no conditions were attached to the first tranche of payments, from the 2nd tranche in 1999/00, payments were dependent on states and territories effectively implementing the agreed framework for water industry reform. The potential loss of NCP payments should help to ensure that reforms are implemented. The institutional reform required under the Agreement should also help to facilitate implementation of any further reforms.

The National Competition Council (NCC) has been assessing the progress in implementation of the NCP and the related reforms, including water reforms. Although improved efficiency is frequently mentioned as one of the goals of water reform, judging by the assessments this is most frequently interpreted as water efficiency, rather than operational efficiency. While principle 6 above emphasises the pursuit of efficient business prices, this has not been the focus of assessments.

The main issues set down for assessment in 2002 were:

- aspects of full cost recovery by non-metropolitan urban water and wastewater businesses;
- consumption-based pricing through two-part tariffs;
- aspects of full cost recovery, consumption-based pricing, CSOs and cross-subsidies in relation to rural water providers;
- any new rural water schemes, to ensure they are economically viable and ecologically sustainable;
- aspects in relation to water allocations in water management plans and water property rights;
- progress in implementing environmental allocations of water;
- integrated resource management practices;
- compliance with the National Water Quality Management Strategy; and
- certain issues concerning public consultation and education obligations.

¹² NCC, 1998

The 2002 NCP assessment shows that much has been achieved in the reform areas. The urban water reforms are essentially in place and there is good progress in implementing the rural water reform agenda. Most States and Territories have separated service provision from regulation, introduced commercial criteria and made progress on pricing. As a result, metropolitan water and sewerage bills fell by over 16% between 92/93 and 97/98, while operating costs fell 2% faster.¹³

Progress in implementing the reforms has been variable, but the steps taken have already had a positive impact on water efficiency in a significant number of urban and irrigation areas. Institutional and legislative changes have laid the groundwork for reform. It is hoped that growing participation in performance monitoring and benchmarking will encourage water service providers to progressively adopt best practice management.¹⁴

4.1 Pricing reform

According to the 1999 Report to COAG, price reform in the cities and the major non-metropolitan urban areas was by then virtually complete, with the result that most Australians in large urban areas now face water prices that reflect the amount of water they use and that reward conservation. Most large urban water suppliers now practise or are implementing full cost recovery. All are achieving, or seeking to achieve, positive rates of return. Progress towards reform by the smaller, local government-owned water businesses has been slower.

Price reform has generally led to higher prices, but the consequential fall in consumption has meant lower water bills. This price elasticity of less than -1, may be partly explained by reductions in property based and fixed charges. For example in NSW Hunter Water Corporation's water bills have fallen because reductions in the fixed portion of bills were greater than increases in the usage portion. The imposition of higher charges for water has been justified in part, as a means of achieving full cost recovery for water services by 2001, in keeping with the CoAG Water Policy Agreement. However CoAG did warn against increasing prices too quickly, especially if price increases were not supported by measures to reduce costs, improve service efficiency and encourage more efficient demand practices by users.¹⁵

Between 1999 and 2002, regulatory reform appears to have continued to produce some positive results, in terms of shrinking water bills and falling consumption of scarce water resources. In Victoria, water bills have fallen by over 60%, while water consumption has also decreased. In Brisbane, residents reduced water consumption by 20% in the 2 years after 1995 because of metering. The use of economic

¹³ Reina, 2002

¹⁴ High Level Steering Group on Water Reform, 1999

¹⁵ Pigram, 1998

incentives seems to have reduced domestic water use and has begun to change the culture of residential water users.¹⁶

Although most states have cost reflective pricing, full cost recovery is not universal. There are still subsidies for rural users and cross subsidy of urban domestic consumers by industry and commerce. The Australian Capital Territory (ACT), NSW, Tasmania, Victoria and Western Australia are generally achieving full cost recovery for urban water supply, with local governments lagging behind.

The achievements in the area of water pricing reform to date include:

- Perhaps most importantly, *consumption-based pricing rather than pricing based on property values* is giving customers appropriate price signals and control over the size of their water bills. IPART intends to do away with the last property value-based prices by the end of the 2003 price determination period. Average household consumption in the ACT fell from more than 400 kilolitres in the late 1980s to 257 kilolitres in 1999-2000.¹⁷ Per person water use in Sydney, Melbourne and Newcastle fell by 7 %, 12 % and 14 % respectively from 1990 to 2000, while per person consumption by customers of a selection of major Australian water utilities fell by 17 % over the 10-year period to 2000-01.¹⁸
- The *introduction of two-part tariffs* has generally led to higher prices, but reduced consumption has led to lower water bills. The average bill of customers in urban areas declined in real terms by around 5.5 % over the five years ending 2000-01.¹⁹ Reductions in property based and fixed charges, has resulted in a decline in bills for the average consumer in NSW. Hunter Water Corporation's water bills have fallen because reductions in the fixed portion of bills were greater than increases in the usage portion²⁰. Since the introduction of the reform process in NSW, price increases (and sometimes decreases) have been kept below inflation due to efficiency gains. This is becoming more difficult as the rate of improvement is becoming more incremental.²¹ Pricing reform in metropolitan New South Wales has resulted in savings to non-residential customers of \$63 million since 1995. This represents a saving of approximately 20 % in real terms;

¹⁶ Reina, 2002

¹⁷ Some part of this fall, however, would be attributable to changed accommodation patterns, such as more apartment dwelling and smaller house blocks, which would reduce water use for gardens.

¹⁸ NCP, 2002

¹⁹ NCC, 2002

²⁰ High Level Steering Group, 1999

²¹ World Bank, 2000

- According to NCC, greater *efficiency* on the part of suppliers is leading to lower prices, improved service and the more productive use of assets, however no figures were presented.²² While operational efficiency concerns have not featured elsewhere, the metro water utilities in NSW have placed a growing emphasis on generating greater efficiencies and reducing costs. In NSW the *real operating costs* for wastewater and water on a per property serviced basis for Sydney Water (SWC), Hunter Water (HWC) and Wyong Council *have declined* between 1993 and 2001, while Gosford Council's costs have remained steady. SWC achieved significant reductions in operating costs per property, down by 22% in real terms from 1993 to 1996, with lesser reductions after that, mostly from decreases in depreciation and return on capital. HWC has proven a leader in driving greater efficiencies, having achieved continual reductions in costs since 1993, with real operating cost reductions per property of approximately 40% since 1990. Gosford council's combined costs have decreased due to decreases in return on capital, while operating expenditures have shown a trend upwards since 1997. Wyong Council's operating expenditures have also declined since 1997²³. With respect to residential customers in NSW, total costs have increased slightly since 1995 (4.7 % in real terms), mostly due to an increase in variable consumption based costs²⁴;
- *Correction of the under-pricing of water* and recognition that water is a scarce resource with prices reflecting the amount of water used, in order to provide an incentive to conserve water.²⁵
- The *deferral of the building of new dams* and water distribution infrastructure is postponing the large cost and price impacts of such expenditure.
- The new pricing regimes arising from the reforms have established equal treatment of customers, including through the elimination of cross-subsidies. In the past, commercial and industrial users paid considerably more for water than households paid; for example, the average commercial establishment paid 15 times more for its water than paid by the average household in 1990-91²⁶. However, real prices paid by low and medium water use businesses in Sydney fell by 75 % and 65 % respectively over the 10 years to 2000-01; high water use businesses were subject to real water and sewerage price increases of around 9 %. Prices paid by average industrial customers in Adelaide fell by 8 % over the

²² Shadwick, 2002

²³ Ipart, 2002. High Level Steering Group, 1999.

²⁴ NSW, 2000

²⁵ NCC, 2002

²⁶ Industry Commission, 1992, in NCC, 2002

same period²⁷. According to a NSW Budget Report, pricing reform in metropolitan NSW has resulted in savings to non-residential customers of \$63 million since 1995. This represents a saving of approximately 20% in real terms.

Price reform in rural areas is less complete. Water constitutes approximately 8 % of total farm costs on average, so higher prices can have a significant impact for water-intensive activities. Some jurisdictions are moving faster than others towards full cost pricing, but the situation is complicated by government subsidies to rural water providers. Full implementation of the water reforms depends on the removal (or full transparency) of government subsidies and the efficient management and operation of irrigation schemes. Where possible, irrigators are now being charged for their water use on a volumetric basis. Cross-subsidies between users are being eliminated and the remaining ones are being made transparent.

New schemes and extensions to existing schemes need to be economically viable and ecologically sustainable before they may proceed. No large new dams have begun construction since the Water Reform framework was put in place, but this principle has been tested by proposals for a dam (which did not proceed) and for extensions to existing schemes. This principle has been prominent in deliberations on new schemes and will be a consideration for new dams being contemplated in Queensland and Tasmania.

In summary rural water pricing reform is:

- being progressively implemented in NSW through IPART which released a determination for bulk water charges. IPART made an attempt at estimating full (efficient) cost recovery levels by region, consistent with the ARMCANZ Guidelines. Applying a ceiling of 20% increase in any one year, prices were determined to yield revenues equal to those efficient costs levels by 2000, wherever possible. The prices set by IPART increased the level of cost recovery achieved in the bulk rural water sector, for all water sources. However, a full cost recovery shortfall will remain for certain regions given the size and cost of the infrastructure in place (North and South Coasts regions) relative to number of water users.
- already implemented in Victoria due to major reforms that occurred in that State in the late 1980's. All of Victoria's rural water authorities were expected to have recovered operational, maintenance and administrative costs, finance charges and renewals annuity for all districts by 2001.
- being implemented in Queensland through a 3 stage implementation strategy. Five year price paths for all rural water supply schemes were established starting from July 1999.

²⁷ Productivity Commission 2002, in NCC, 2002.

- being implemented in South Australia consistent with the State Government's policy on Community Subsidy Obligations.
- fully implemented in Western Australia through irrigation customers paying the full cost of water distribution and a transparent CSO being paid to the Water Corporation for costs not recovered from bulk water charges to irrigation service providers; and establishing transparent CSO's for rural water supplies where the cost of supply is higher than equivalent Perth charges. This uniform pricing policy reflects the Government's commitment to regional development.
- being implemented in Tasmania in the Government-owned irrigation schemes.
- The ACT has made progress towards the fulfilment of requirements for the water pricing milestones. A two-part tariff has been in place since 1995, and all bulk-water is supplied on a cost-recoverable volumetric basis.

4.2 Institutional reform

4.2.1 National regulation

As already mentioned, overall responsibility for Australian water and wastewater services lies with State and Territory governments. Although fragmented, Australian water regulation sits within the broad National Competition Policy. By 2002, most States and Territories had independent economic urban water regulators. Municipalities were not included, though they are service providers in Queensland, NSW and Tasmania. Multi-utility independent economic regulators which also monitor service standards are becoming the model for State and Territory governments.²⁸ The water sector in 2002 has not experienced much privatisation, and assets remain overwhelmingly public.

The Office of Regulation Review (ORR) is the Commonwealth Government's regulatory reform 'watchdog'. The ORR vets and reviews regulations to ensure that they are properly formulated and do not impose undue costs on business and the community. Government policy aims to ensure that regulation is not only effective, but is also the most efficient means for achieving relevant policy objectives. To help meet this objective, the Government has introduced reforms to the way regulation is made or reviewed, by requiring cost-benefit analysis for regulation that is likely to affect business or restrict competition. The costs and benefits of regulation are to be weighed carefully to ensure that expected benefits are not outweighed by excessive economic and financial costs. The ORR is an autonomous unit located within the Productivity Commission.

Government policy requires that a Regulation Impact Statement (RIS) be prepared for regulatory proposals which affect business or restrict competition. A RIS

²⁸ Reina, 2002.

provides a consistent, systematic and transparent process for assessing alternative policy approaches to problems. It includes assessment of the impacts of the proposed regulation on different groups in the community, including a specific focus on small business. Under the April 1995 COAG agreement, regulation and national standards which require the approval of Ministerial Councils or standard setting bodies must be subject to a RIS.

The ORR's functions include (among others):

- examining RIS's prepared by departments and regulatory agencies and advising whether they meet the Government's requirements;
- providing training on best practice regulation to Commonwealth departments and agencies;
- advising the Government, Commonwealth, departments and regulatory agencies on appropriate quality control mechanisms and the development of regulatory proposals;
- reporting annually on compliance with RIS guidelines and on regulation reform developments;
- providing advice to Ministerial Councils and standard setting bodies on COAG guidelines;
- commenting publicly on regulatory issues; and
- monitoring regulatory reform developments in the States and Territories and in other countries.

4.2.2 State-level regulation

The principle of institutional role separation contained within the 1994 Framework Agreement on Water Reform requires the function of water service provision to be separated from the roles of water resource management, standard setting and regulation. By 2002, most states had established independent regulators and introduced the required institutional reforms.

Table 1: State-level economic regulation

Economic Regulator	Mandate
New South Wales: Numerous utilities serve non-metro urban areas plus 4 major urban utilities. WSP's are generally vertically integrated urban utilities and local govt councils in non-urban areas. The water services provided by councils are independent, whereas urban utilities are issued operating licenses and have customer contracts.	
Independent Pricing and Regulatory Tribunal (IPART)	Provides independent pricing oversight for water, gas and electricity utilities

	IPART has three major roles: • price regulation and pricing policy reviews of government monopoly services • reviews of industry, pricing or competition • registration and arbitration of access agreements. For declared government monopoly services, the Tribunal is empowered to: • determine maximum prices; and • carry out a periodic review of pricing policies. In making pricing determinations, have to consider: <i>Consumer Protection</i> • protecting consumers from abuses of monopoly power • standards of quality, reliability and safety of the services concerned • social impact of decisions • effect on inflation. <i>Economic efficiency</i> • greater efficiency in the supply of services • the need to promote competition • effect of functions being carried out by another body. <i>Financial viability</i> • rate of return on public sector assets including dividend requirements • impact on pricing of borrowing, capital and dividend requirements of agencies. <i>Environmental</i> • promotion of ecologically sustainable development via appropriate pricing policies • considerations of demand management and least cost planning. Urban water services, local water authorities, water supply schemes and rural bulk water services are among the declared government monopoly services. IPART has provided a set of pricing principles to guide local authorities.
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Victoria: Since 1995, the water industry consists of 3 water retail utilities and one bulk supplier serving Melbourne. (All the Melbourne water corporatised entities are owned by the State government.) Outside Melbourne, 19 regional water authorities (15 urban, 4 rural). The policy of the new government is to retain public ownership of all water authorities.

Essential Services Commission, established 2002 Will regulate water from	The ESC was established to protect the interests of consumers and to ensure reliable supplies of utility services. It is an independent economic regulator of the electricity, gas, ports, grain handling and rail freight industries. It will regulate Victoria's water and sewerage services from
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2003	January 2003. It will be the first independent economic regulator for the metro and non-metro water and sewerage industry and the rural water industry. Until 2002, the existing regulatory arrangements for Victoria's water industry were complex, with four separate arms of government having direct regulatory roles. The water industry in Victoria comprises a metropolitan, non-metropolitan urban and rural water sector. Price regulation was the responsibility of the Minister for Environment and Conservation, while the Office of the Regulator-General was responsible for customer service. The previous Government had originally intended to pass pricing oversight to the ORG eventually, but it never did so.
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Queensland: Most water provided by largest 17 local governments, but there are also around 100 other water providers. Generally the State is responsible for bulk water, and local government for treatment, reticulation and wastewater.

Queensland Competition Authority (QCA)	Municipalities set their own prices, but QCA has price monitoring powers and can make recommendations. Under the QCA Act, the QCA is required to monitor and report on the pricing practices of certain monopoly activities, in order to prevent excessive charges. The QCA's prices oversight responsibilities are recommendatory only, and the Authority may undertake an investigation only in response to a Ministerial reference. QCA either investigates the pricing practices of government monopolies or simply monitors the prices charged by them, depending on the referral it receives, as the QCA can only perform these functions on request from the Premier and Treasurer. It also has prices oversight responsibilities for private sector water suppliers.
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Western Australia: Urban water supplied by 3 water corporations, elsewhere 20 water authorities

Minister for Water Resources responsible for economic regulation. Function may shift to new Economic Regulatory Authority (ERA)	Structural separation of the roles of water resource management, standard setting and regulatory enforcement from service provision saw the Western Australian Water Authority be split into three new agencies from January 1996, with the establishment of the Water and Rivers Commission, the Office of Water Regulation (OWR) and the Water Corporation. The OWR was created as a licensing authority for water services and to be a source of policy advice on the economic performance of the water industry. However, the WA Government is due to establish the ERA, a multi-utility independent price regulator, which will set water prices. OWR sets and monitors service standards and advises government on corporation's performance, but this function may shift to the new ERA.
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South Australia: SA Water is virtually the only water services corporation

Minister determines prices. New Essential Services Commission of South Australia (ESCOSA) estab 2002 may change this.	The minister for water resources sets service and financial standards for the sole water service provider, following negotiations with the finance ministry. The minister fixes prices for water provision.
Tasmania: Local government has kept their individual responsibility for water reticulation and sewerage. 3 bulk and 30 local government retailers. Hobart Water is a joint bulk water authority formed by 8 Hobart Councils.	
Local government sets own prices. Government Prices Oversight Commission (GPOC)	Municipal water authorities are self price regulating, but are independently audited for compliance with the NCP. For Hobart Water, the GPOC sets the pricing framework but the Minister decides the outcome.
Australian Capital Territory: Single water provider	
Until recently, economic regulation contracted out to IPART (NSW). From 2000, replaced by own Independent Competition and Regulatory commission (ICRC)	ICRC is responsible for the setting of monopoly prices, including the single water service provider, ACTEW. Under new regulatory system, there are 4 regulators: economic, technical; environmental; and the drinking water quality regulator.
Northern Territory: Power & Water Authority is the sole water provider	
?	Economic regulation is shifting from the government to the state's electricity regulator. Implementation has been delayed due to cost considerations.

5. Economic regulation: from local authorities to utilities

In general, the economic regulation of state utilities is undertaken by independent multi-utility regulators. This section will focus on the some of the different approaches to economic regulation throughout Australian, looking in particular at those States where local government has a significant role to play in water services, namely Tasmania, Queensland and New South Wales.

5.1 Utility regulation

The trend in Australia has been towards the establishment of independent multi-utility economic regulators. While in Queensland the QCA may only investigate prices in response to a request from the Minister, and may then only make recommendations, IPART in NSW may determine price paths for certain declared government monopoly operations. Where regulators have the power to set prices, they generally determine a 5 year pricing path or band. Rather than setting specific prices, this indicates the minimum and maximum prices which utilities may charge during the period. The minimum level is set at the level required to cover full costs and to be a

viable business, while the upper bound is aimed at preventing excessive monopoly profits

According to the CoAG guidelines, the basic costs or "building blocks" which need to be covered by water revenue in determining prices include:

- operation, maintenance and administration;
- provision for the cost of asset consumption;
- provision for the cost of capital; and
- externalities.

However, this approach is considered by IPART to be too rigid to be used in isolation as the basis for the Tribunal's determination. They therefore also consider the implications of the pricing outcome on consumers and the agencies overall profitability and financial viability.

IPART may fix maximum prices in one of two ways:

1. They might determine maximum prices in any way that the Tribunal considers appropriate, such as setting specific prices for individual services, increasing or decreasing prices for individual services or groups of services, setting a rate of return on assets, or referring to the CPL. The agencies concerned are required to fix prices so that they do not exceed the maximum price determined by IPART;
2. or, they might establish a methodology for determining maximum prices to be used by agencies, if it is impractical for the IPART to set maximum prices.

The Tribunal's current approach in the water industry is to determine the maximum prices for specific services. These prices are then adjusted over the period of the price path for:

- movements in general inflation
- efficiency gains, and
- significant changes in the operating environment, for example new environmental standards or customer service standards.

These prices will generate a given level of revenue based on an assumed level of services delivered, in terms of both quality and quantity. The level of prices may, in turn, influence the demand of customers for the particular services.

5.2 Balancing the promotion of efficiency with the desire for improved service levels

The Tribunal has used an incentive regulation approach in order to promote operational efficiency improvements in water businesses. IPART sets a target level

of efficiency improvement for a given level of prices and level of services. To the extent that agencies have exceeded the targeted efficiency gains they have been allowed to retain those additional savings within the agency for the period of the price path. The Tribunal sets prices for water services on the assumption that existing standards of service will at least be maintained. The Tribunal is concerned that there is little incentive for water businesses to improve the levels of service they deliver to customers above the minimum requirements. Further, they may not provide an adequate safeguard against reductions in service levels to minimum standards through the implementation of efficiency measures. The Tribunal is therefore seeking to create better incentives for the delivery of quality services consistent with customers' demonstrated willingness to pay for higher service levels.

The Tribunal is considering two, potentially complementary, approaches to facilitating enhancements to customer service levels. Water agencies, in making submissions to the Tribunal, may seek price rises specifically to fund costs associated with proposed enhancements to service levels. Where agencies propose such enhancements they will need to demonstrate to the Tribunal:

- the benefits that will accrue to customers;
- customers willingness to pay for proposed enhancements to service;
- that performance data is available to verify achievement of proposed outcomes, and that the proposed enhancements are the most efficient means of achieving the proposed outcomes.

Where a water agency has satisfactorily addressed these issues the Tribunal will consider allowing for increased expenditure in calculating a revenue requirement, subject to what it considers to be appropriate restraints on overall price movements. It would then monitor the related expenditure and resulting service performance outcomes. Additionally, the Tribunal is considering development of approaches to enhance the financial incentive to businesses to provide improved or comparatively higher levels of customer service during the course of a price determination period. Effectively, this would mean that businesses that increase the level of service provided to customers in key areas, within an existing price framework, would be allowed marginally higher prices at the next periodic pricing review. Businesses that decreased pre existing levels of service delivery would be allowed marginally lower prices than would otherwise be the case.

5.3 Regulation of local water authorities

There is no formal regulation of local government water service providers in Australia. Under the various Local Government Acts, local water authorities generally operate independently, and the recent CoAG reforms have been aimed primarily at State-owned water utilities. However, the NCP and various amendments to Local Government Acts in the different States and Territories have required that

local governments align their operation with the broad CoAG and NCP principles. In most cases they are still free to set their prices, and "regulation" takes place mainly in the form of guidelines and recommendations.

In *Tasmania*, the Government Prices Oversight Commission (GPOC) developed a set of guidelines to establish measurable criteria to assist local councils to individually assess whether the implementation of two-part (access and consumption based components) is cost effective in their jurisdiction. This reflects the opinion held by ARMCANZ that economic regulation guidelines must be flexible, and allow for a variety of contexts in order to avoid undesired pricing effects. The GPOC is also developing principles to ensure that local councils can successfully meet the asset renewal and asset maintenance requirements of the CoAG and ARMCANZ water pricing guidelines.

IPART in *NSW* has recognised that determining maximum price paths for all 126 local water authorities is not feasible. They also recognise that different contexts call for different measures. They have instead developed pricing principles for local water authorities, to allow them to 'self-regulate', and to enable customers to evaluate the performance of their service provider. These principles, which are modelled on the CoAG Agreements, are to be adopted where it is feasible and cost effective. The NSW Department of Land and Water Conservation (DLWC) and the Department of Local Government (DLG) are providing advice to councils and monitoring implementation of the IPART pricing principles. The benefits of pricing principles include:

- Greater consistency of purpose among authorities dealing with a resource which services wide ranging community needs;
- Allowing better comparison and coordination of resource management among local communities, and
- Enabling scrutiny of prices and costs.

A number of these local water authorities were included in the list of those for whom the Tribunal is meant to determine a maximum price path (Schedule 1 authorities). However, the Tribunal feels that Schedule 1 local water authorities outside the metro areas should not be treated differently from other local water supply authorities. IPART believes that the current situation, where local water authorities are subject to *scrutiny by elected officials*, can be effective in informally restraining the pricing practices of local water authorities. In the case of water authorities where boards of management are appointed by local stakeholders, such as local councils, major users, etc, IPART has recognised that price restraints may be weaker than for water supplied by local councils which are subject to the direct scrutiny of electorates. However, the Tribunal does not believe that the current situation justifies differential treatment. They acknowledge that this approach may need to be reviewed if future amalgamations resulted in an increase in the number of large non-metropolitan water

supply authorities. The ability of elected officials to place effective pressure on local water authorities for price restraint may be weakened if these authorities grew and expanded to cover a number of local government areas. This weakening may occur as a result of:

- the greater ability of local water authorities to influence local decision makers as their size increases;
- a sharing of responsibility for local water authorities across local governments, reducing the accountability of any one group of local government officials for the performance of the water authority.

In the absence of informal price restraints, formal price capping arrangements might need to be considered. A reduction in the number of water authorities would facilitate the establishment of formal price capping arrangements if the community considered such caps to be necessary. Formal price capping may also have to be considered if the "light handed" approach to regulation advocated in the guidelines proves to be ineffective. The pricing principles set out in the guidelines are intended to provide each authority with a basis by which to "self-regulate" and their customers with standards by which to judge the authority's performance in this regard. IPART believes that this "light handed" approach to regulation should be given a chance to work, but more extensive regulation may become necessary if it proves to be unsuccessful.

Under the Competition Principles Agreement, all significant business activities of local government authorities must be subject to corporatisation principles. In NSW the government has decided that local government business activities with annual sales turnovers in excess of \$2 million fall into this 'significant' category. The corporatisation model to apply to these activities does not require formal or legal incorporation as a separate organisation, but the activities must be separately identified within the operations of the local council.

Outside metropolitan Melbourne in *Victoria*, water services are the responsibility of 19 regional water authorities which were the result of previous consolidations of hundreds of local government water businesses. Fifteen of these are urban, and four rural. The Rural Water Authorities in *Victoria* have established Water Services Committees (WSCs) to ensure that the trade-offs between customer service levels and low prices are established and agreed to by customers. Therefore, the existence of effective WSCs may provide some degree of independent price control through consultation, joint decision making and transparency. However, the structure and composition of the WSC's varies across the RWA's, ranging from formal advisory committees to informal consultative groups. This may result in some WSCs performing more effectively than others.

In *Queensland*, the Local Government Act of 1993 required that the large 17 local governments consider the application of full cost pricing. The definition of full cost

pricing aligns with the ARMCANZ Water Pricing Upper Bound, and therefore includes a commercial rate of return on scheme assets. By 1998, 11 of the 17 large local governments had implemented commercialisation (which incorporates full cost pricing), with the six remaining local governments implementing full cost pricing. The remaining local governments are being encouraged to implement water reforms formally through a Code of Competitive Conduct and through access to the Local Government NCP Financial Incentive Package. Queensland is one of the few states to share the NCP payments with Local Government, in recognition of their contribution to water reform. Although no water specific guidelines have been produced as in NSW and Tasmania, the Queensland Department of Communication and Information, Local Government & Planning released a guide to Full Cost Pricing for Local Government in 2000, in order to help local government meet the requirements of NCP.

6. Some lessons for South Africa

- The National Competition Policy payments from the federal government were a key driver of reform at State level in Australia. South Africa must ensure that they possess the required leadership and put in place adequate incentives in order to achieve economic reform in the water sector.
- The move away from property-based charges to consumption-based pricing and improved metering has had a significant impact in Australia. South Africa appears to be ahead of Australia in terms of metering programs.
- In terms of the institutional context, South Africa and DWAF is currently in a similar position to where Australia was *before* the CoAG water reforms, with DWAF responsible for water resource management, standard setting and regulatory setting. Under the CoAG Agreement, as far as possible these roles were separated institutionally, with each role undertaken by separate agencies.
- Although improved efficiency in service delivery is one of the principles underpinning the water reform process in Australia, the emphasis seems to have fallen on efficiency in terms of water usage, with the 2002 NCP assessment issues not referring to improved operational efficiency. With the exception of IPART, little mention is made of cost-efficiency gains. At the moment IPART is grappling with how to ensure that reductions in operational costs are due to real efficiency gains, and not deteriorating service levels.
- The Australian concept of Regulation Impact Statements are worth considering in South Africa. These would help to assess alternative regulation policy options in terms of a cost-benefit analysis, and to assess the impact of proposed regulation on different groups in society.

- The South African situation is most similar to NSW, Queensland and Tasmania, where local authorities are responsible for water reticulation and sewerage. However while NSW has a strong regulator with price-setting powers for several utilities, it has concluded that it will be impossible to directly regulate all 126 local water authorities in the state, and is instead advocating principles with which local authorities and their elected officials can regulate themselves. Tasmania and Queensland have also released pricing guidelines to be used by local government, rather than attempting direct regulation.

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ANNEXURE C

**Economic Regulation of water in Chile –
A case study**

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1. Introduction

The provision of adequate water and sanitation services have long been identified as crucial for public health and hence for poverty alleviation and development. However, the provision of water and sanitation services has remained among the most enduring challenges in most developing countries. A report released by the United Nations Habitat (United Nations Human Settlements Programme) disclosed that:

...about 1 billion people live in slums without even the most basic services like sustainable sanitation. ... Each year, more than 2.2 million people die from water and sanitation related diseases, many of them children. However, a disproportionate number of people are infected in cities because of their high population densities and the resultant high concentration of human and other waste. In fact, child mortality rates in cities without proper sanitation are 10 to 20 times higher than those in cities with adequate sanitation.¹

In most developing countries the operation and regulation of the water and sanitation utilities have been in the hands of governments and have been characterised by high levels of inefficiency that range from low quality service, insufficient coverage, low investment, poor maintenance and high levels of unaccounted for water. There is a general consensus that the inefficiency of the utilities is mainly due to inappropriate regulatory mechanisms which result in low prices which do not reflect the true costs of the services provided. A World Bank study shows that revenues collected by public utilities cover only 35 percent of the cost of water provision.² Thus many public utilities depend heavily on government subsidies to meet their operating costs.

The disregard for commercial pricing has been based on the misconception that water is a social good and that the poor would benefit from the heavily subsidised provision of this good. However, several studies show that, in fact, the majority of the poor are worse off when water is heavily subsidised because they do not have access to subsidised piped water and are less likely to obtain access to piped water precisely because the piped water is heavily subsidised. Instead, the poor they are forced to rely on private vendors and end up paying extremely high prices compared to public piped supplies.³ Moreover, in most cases the poor may indirectly contribute through general taxes (such as sales or value added taxes) to the subsidies enjoyed by the middle and high income water users (Sherman, 1989:38). Thus, in addition to production and distribution inefficiencies, underpricing of water and sanitation leads to a socially unacceptable and unethical

¹ UN-HABITAT Report, March 25, 2003.

² Haarmeyer and Mody, 1997.

³ This is a situation known as the "hydraulic law of subsidy": the subsidies support the provision of piped water, and therefore benefit the better-off who already have access to piped water (Briscoe, 1995:30).

distribution of income that severely hampers the welfare of the poor. As a result most developing countries find themselves in a "low-level equilibrium trap"⁴ which in most cases makes reform a trivial and reversible exercise.⁵ The continued under-pricing of the water and wastewater services

- provides little incentive for the water companies to expand service provision for the poor (resource allocation inefficiency);
- leads to distributional inequality due to the high subsidisation of piped water which is inaccessible to the poor;
- sends the wrong signal about the scarcity of water; and
- undermines the need for maintenance and new investment.

A number of developing countries have initiated reforms after comprehending the problems that are linked with the under-pricing of water and wastewater services. In this regard the reform process in Chile stands out as one of the most successful and has been regarded as a model for developing countries. In this study we explore the structure, characteristics and conceptual basis of Chile's reform in water and wastewater service provision, with an emphasis on pricing and subsidy mechanisms. In doing so, our main objective is to identify the important lessons and insights that may be of significance for South Africa in the restructuring of its water and sanitation sector in order to achieve the goals envisaged by DWAF.⁶

The study is organised as follows: Section 2 briefly describes the pre-reform situation of the Chilean water and sanitation sector. Section 3 presents the salient characteristics and phases of the reform, with due emphasis on the new water regulation methodology. This is then compared with other widely used models. Section 4 offers a brief outline of the tariff administration procedures. Section 5 presents Chile's water consumption subsidy scheme. Finally, section 6 draws some important lessons for South Africa.

2. Chile's water and wastewater sector: pre-reform

Chile's water and sanitation sector has undergone massive regulatory and operational reforms since the late 1970s. The pre-reform water and sanitation sector in Chile can be characterised as follows:

⁴ A vicious circle where people are less willing to pay for less satisfactory services, so that income generation for maintenance and improvement remains low and service standards decline further. (See Briscoe, 1995, for more examples.)

⁵ This case is well-known in the economics literature as the "time-inconsistency" problem of policy, in that reforms can be reversed if there are institutional and political constraints or when reforms are intended to achieve two or more desirable yet conflicting goals (for example, the social pricing [under-pricing] of water, and a high coverage and quality service).

⁶ See DWAF Mission Statement on the DWAF website www.dwaf.gov.za.

- High urban coverage of potable water yet very low provision of sanitation service and absence of wastewater treatment and safe disposal of collected sewage.⁷
- Low levels of tariffs for consumers coupled with a cross-subsidy scheme resulting from "a tariff policy that was internal to bureaucracy [as the subsidy scheme had no clearly-defined criteria or guidelines], ad hoc, and vulnerable to political manipulation".⁸
- Publicly owned and managed water and sanitation companies whose operations were defined on social and political rather than economic considerations.
- A large number of regulators, usually different bodies of government, with no clear division between the regulatory and administrative functions.⁹
- Near universal metering and an 80% collection rate, which was high by regional standards; yet a very high level of unaccounted-for water (37 percent of total water produced in 1987).¹⁰

3. The reform

This section presents the main characteristics of the reform process at different phases with due emphasis on the structure of the new water tariff system.

3.1 Characteristics of the reform

The major driving force for the water and sanitation sector reform in Chile was a combination of political and economic phenomena.¹¹ On the economic side the long standing financial constraints of the water utilities, coupled with constitutional constraints limiting increases in government spending, made it hard for the democratically elected Eytwin government to reduce its large debt while expanding social spending. The political pressure from increased demand for water and adequate sanitation was enormous, as the main supporters of the administration were from the lower income groups. Thus, unlike the preceding military government of Pinochet whose supporters were from the higher income classes and supporters of privatisation, the Elywin administration decided to move ahead with reform and raise tariffs enough to allow the water utilities to cover costs and pay dividends. The government intended to improve the fiscal deficit while at the same time easing the political pressure against the tariff increase by using a certain proportion of the dividend to subsidise the consumption of water by poor households.

⁷ Alfaro, 1997:2.

⁸ Shirley et al, 2000.

⁹ See Chavez and Quiroga, 2001a and 2001b, and Alfaro, 1997.

¹⁰ Shirley et al, 2000.

¹¹ For detail see Shirley et al, 2000.

Generally speaking the reform went through three phases of institutional reforms.¹²

Phase 1 (1977): aimed at integrating water and sanitation services to take advantage of economies of scale.

During this first phase a new central regulatory body, SENDOS, was instituted. It was made responsible for the central planning, administration and financing of water and sanitation services which were previously under different government bodies. Two semi-autonomous water utilities, EMOS and ESVAL, were established in the Metropolitan areas of Chile, Santiago and Valparaiso respectively, while 11 regional agencies were established. SENDOS was responsible for the operation and regulation of the regional agencies and for the regulation of EMOS and ESVAL. This allowed some gain of economies of scale, as manifested by increased coverage of service and improved maintenance and investment.¹³

However, tariff levels remained low and the utilities continued to depend on government subsidies. These low levels of tariffs and constraints to government subsidies made it impossible for the utilities to secure the required level of investment for the maintenance, replacement and expansion of systems. This constrained the efficiency of water and sanitation service provision. In addition the dual responsibility of SENDOS as regulator and operator of the regional water utilities allowed for lax management and provided little incentive for efficiency.¹⁴

Phase 2 (1988/89): aimed to give financial stability to the water utilities, while reinforcing the regulatory capacity of government.

The most important reform of Chile's water and sanitation sector was accomplished during the second phase of the reform. The main objective of the reform during this phase was to give the utilities financial stability by reforming the tariff structure to reflect the true cost of water and sanitation provision. As a result, a tariff structure that aimed to recover the full cost of service (variable and fixed cost) based on a long-run marginal cost pricing scheme for both water and sanitation was effectively introduced. The tariffs were set for five years with adjustments for inflation and other macroeconomic fundamental changes during this period.

One major characteristic of the tariff adjustment was that the structure consisted of fixed and variable costs and considered a capital return of at least 7% in real terms.¹⁵ The tariff was set for five years, thus in effect resembling price cap regulation and providing an incentive for the utilities to take advantage of cost effective measures. In addition, the calculation of the tariff was based on a hypothetical computer-simulated "efficient model company". The efficient model

¹² Alfaro, 1997.

¹³ Lee, 2000.

¹⁴ These are common characteristics of self-regulated public utilities.

¹⁵ Shirley, et al. 2000.

company (or model company for short) serves as a benchmark to compare the production and allocation efficiency of the utilities, thereby providing a quasi yardstick competition. As we shall see with some detail in section 3.1, the model company also serves in reducing information asymmetry and moral hazard.

The new tariff structure does not differentiate between different types of users. Instead, peak charges are set for consumption of water during peak demand seasons. The previous cross-subsidy mechanisms that differentiated between different types of users and which, in general, under-priced water for all consumers was substituted by means-tested direct subsidies to the poor. The central government channelled the subsidies through the municipal governments who made direct payments to the utilities for eligible consumers. (See section 5.)

The second phase of the reform also saw the establishment of a concession system that granted private or public companies the right to offer water and sanitation services for an unlimited period of time, as long as they met and maintained agreed standards and operations. This concession right is transferable and can be sold.¹⁶ However, none of the concessions in Santiago were put out to competitive tender.¹⁷ The concessions were thus granted in a manner that undermines potential competitiveness and hence efficiency.

In general during this phase of the reform process, the water and sanitation tariff structure was reformed to reflect the true cost of the services with the objective of transforming the utilities into financially independent enterprises that operate along commercial lines.¹⁸

Phase 3 (1998): aimed to privatise the public water and sanitation companies.

The desire to privatise the public water and sanitation companies, most of which were operating well, was fuelled by the belief that privately-owned utilities are more flexible to adjust and survive in an ever-changing and competitive environment. It was also believed that the privatisation of the utilities would strengthen the administrative capacity and technological development of the companies. As a result:

...in less than three years [since the process of privatising the public water utilities started in 1998] more than three quarters of Chilean households were being served by private water companies. Although only 5 of the 13 regional companies were privatized, they included those serving the three largest urban centers: Santiago, Valparaíso, and Concepción. ... Initially only 51 percent of the shares of each company were sold. In 2002-03 the Chilean government is expected to sell part of its remaining stake in the privatized companies.¹⁹

¹⁶ Alfaro, 1997.

¹⁷ Shirley, et al, 2000:30.

¹⁸ See Haarmeyer and Mody, 1997:3.

¹⁹ Bitrán and Valenzuela, 2003:2.

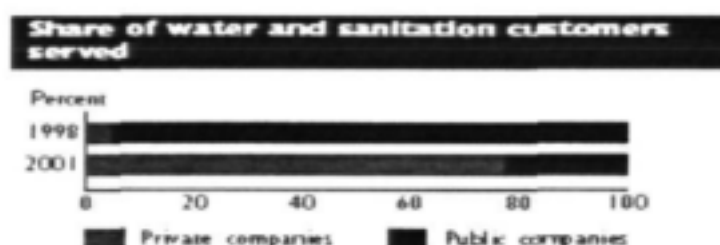


Figure 1: Share of water and sanitation customers served

Source: Bitrán and Valenzuela, 2003:3

For the purpose of this study, which reviews the Chilean experience in water and sanitation regulation in order to draw some lessons for South Africa, the second phase of the reform is of greater interest because at the current stage of South Africa's water and sanitation sector reform, the design and implementation of appropriate and efficient tariff and subsidy policies together with efficient administrative and regulatory procedures are of particular concern. The rest of this study therefore focuses on systematically reviewing Chile's tariff and subsidy policies and principles within the context of regulatory and administrative reforms.

3.2 The tariff structure

As sketched briefly above, the major component of Chile's water sector reform was the structural reform of the water and sanitation tariffs in order that the tariffs reflect the true cost of providing the services. This has transformed the water utilities into commercially oriented enterprises that are subject to regulation. The regulation is aimed at ensuring minimum distortions from social and political considerations.

The tariff reform was intended to remove the under-pricing norm of the previous tariff structure and to provide appropriate incentives to consumers for rational use of water and to producers to improve overall production and distribution efficiency, including coverage and quality of water provision. To this end the new water and sanitation tariff system is structured on the bases of five principles:²⁰

- i) dynamic efficiency
- ii) economic efficiency,
- iii) self financing,
- iv) intelligibility, and
- v) equity.

Dynamic efficiency means that the new tariff system assumes that the water and sanitation utilities operate efficiently and meet the norms and standards set by the

²⁰ Chavez and Quiroga, 2002a, and Gómez-Lebo and Vargas, 2001.

regulator with the minimum cost that is technologically feasible. This principle is explicitly embodied in the tariff structure through the introduction of the efficient model firm which is a computer simulated conceptual firm that operates efficiently. The introduction of the model firm in the Chilean tariff system has been justified as an innovative way of addressing the commonly known asymmetric information problem that made it hard for the regulator to find the true information from the utilities regarding their costs of operation, demand, investment and other important parameters that are required in setting the tariffs. The efficient model firm is therefore used so that regulators can estimate these parameters with little reliance for information on the actual utilities. (The conceptual foundation and administration of the model firm is discussed in more detail in section 3.3 of this study.)

Economic efficiency refers to the basic economic principle that assumes or postulates that a firm is operating efficiently when it operates at a point where its marginal cost is equal to its marginal revenue. This simply means that the value of the water and sanitation services provided by the utilities should be equal to the opportunity cost of providing that service, that is, the value or cost of alternative use of the water. If the marginal cost is higher than the marginal revenue (as is the case in most countries where water and sanitation tariffs are under-priced), the utilities make losses and the provision or coverage of the services would be limited and of low quality, although the consumption and demand for water would be high. Similarly, if the marginal cost of water is lower than the marginal revenue, that is, the water is over-priced, then the utilities make profits above the normal return but the affordability (and hence demand for) and provision of water would be less. The second scenario is the normal tendency of natural monopolies, hence the rationale for their regulation. Both these cases reflect a situation of inefficiency, which could easily (at least theoretically) be corrected by regulating tariffs to reflect the marginal or opportunity cost also referred to as the true cost to society of providing the services.

The concepts of short-run and long-run marginal costs are of vital importance in determining the tariffs. Briefly speaking, the main difference between the long-run and short-run marginal cost is the time horizon considered. The short-run cost, as the name implies, considers only the short term horizon where required investments and maintenance costs are held constant. It considers only variable costs and ignores fixed costs, whereas the long-run marginal cost considers the variable costs as well as the fixed costs. In the case of natural monopolies such as water and sanitation most costs are fixed and require a huge capital investment in infrastructure.²¹ In general long-run marginal cost is very high when compared to the short-run marginal cost. A fundamental question addressed below is which of the two marginal costs should be considered when determining tariffs.

In the Chilean tariff structure the notion of economic efficiency is incorporated through the adoption of the so-called average incremental cost (AIC). The average incremental cost is a variant of the long-term marginal pricing. However,

²¹Baumann, et al, 1997:1443-145.

unlike the long-term marginal pricing which may be viewed as static, the incremental cost of development considers projected costs of investment that would be made to meet forecasted increases in demand. The average incremental cost can be formally defined as:

... [the] value equivalent to a constant per unit price which, when being applied to the incremental forecasted demand, generates revenues to cover incremental operation efficient costs and the required investment from an optimised project of expansion of the firm, such that it should be consistent with a net present value (NPV) of the project equal to zero.²²

From the definition one can easily understand that the incremental cost enables the utilities to cover their entire operational and fixed costs as well as future investment costs that are needed to meet future demands.

The third principle that is embodied in the Chilean tariff structure is **self-financing** by the utilities. This is intended to ensure financial stability and independence for the water and sanitation utilities through a full cost recovery mechanism. This is the reason why long-term marginal cost instead of the short-term marginal cost is considered. Moreover, the self-financing principle is the main reason for the incremental cost of development principle in cases where new investment spending is planned to meet projected increases in demand.

At this point, it is worth noting the trade-off between the self-financing or full cost recovery principle and the economic efficiency principle. From an economic standpoint efficiency requires that the tariff should be set equal to the short-run marginal cost. However, as we mentioned above, the short-run marginal cost pricing would not enable the utilities to generate sufficient income to recover full costs. There is therefore a conflict between the objectives of economic efficiency and self-financing. In this case the Chilean tariff system can be seen as one that seeks to achieve economic efficiency subject to a self-financing restriction. To put it the other way around, the tariff system seeks to achieve full cost recovery with the minimum possible distortion to economic efficiency. The Chilean tariff system follows the so-called Ramsey optimal taxation principle, which is a well-known microeconomics concept. The Ramsey principle imposes a self-financing constraint on the public utilities in such a way that they would break even. The self-financing constraint is justified as a requirement to avoid socially unfair results of marginal cost pricing, whereby non-users of the services are forced to pay indirectly through tax and tax-induced distortionary effects elsewhere in the economy.²³

The fourth principle embodied in the Chilean tariff system is **intelligibility**; which refers to the fact that the tariff structure is designed to provide appropriate incentives to guide the consumption and provision behaviour of consumers and

²² Chavez and Quiorga, 2002a:7-8.

²³ For more elaboration see Sharman, 1989.

water utilities respectively. Basically, the tariff is set so that consumers pay the true cost of the services. This is reinforced by metering the water consumption of each individual household thereby avoiding free-rider problems and associated wasteful use of water common where the marginal price of water to the consumer is zero. Moreover, the new tariff structure has avoided cross-subsidies, making every household solely responsible for the full cost of its consumption, although individual means-tested direct subsidies are available to the poor up to a certain maximum volume (recently set at 15 cubic metres per month).

The tariff also provides an incentive for water utilities to be efficient. This, as we will show in section 3.2 and 3.3, is due to two fundamental facts that are incorporated into the Chilean tariff system:

- The setting of the tariffs for a fictitious ideal model company based on potential efficient cost of production embodies a high incentive power for production efficiency.
- The reasonable period of time (five years) between tariff revisions (except for adjustments for unforeseen major macroeconomic changes) enables the water utilities to enjoy profits until the next tariff revision if they can cut costs below the model company. Similarly, if the utilities fail to bring down their cost to the cost of the model company they would be forced to bear the loss, as it cannot be transferred to consumers or subsidised by government. Therefore in essence the Chilean tariff which is determined based on the model company resembles the price cap regulatory scheme (with a subtle difference, however, that will be explained in section 3.3).

The last principle that is incorporated in the tariff is **equity**. In Chile the tariff structure does not discriminate between different types of customers, except when justified by demographic and topographic differences that involve different costs of service provision. The demographic difference refers to the difference in the population size in different areas. In general households in loosely populated areas pay higher tariffs than households in densely populated areas. The reason is that the cost of investment per unit of water consumption is higher in less populated areas. Similarly, topographic issues refer to differences in the distance of areas from water sources, scarcity of water and landscape differences such as altitude from the source of water. These factors directly affect the cost of service provision. Aside from these justified differences, all types of consumers pay the same tariff for the same consumption. However, this doesn't mean that the tariff system ignores or abandons the poor, as the tariff is complemented by direct subsidies that target the poor. The new tariff system simply removes the responsibility of subsidising the poor from the water and sanitation utilities to the government.

From the foregoing discussion, it could be generalised that the Chilean water and sanitation tariff system seeks to achieve an incentive-providing (*intelligibility*) and non-discriminatory pricing (*equity*) based on technologically feasible minimum marginal cost (*dynamic and economic efficiency*) subject to a full cost recovery (*self-financing*) requirement.

The reform in the tariff structure has been phenomenal. The new tariff level, which is revised every five years, is set in such a way that the discounted earnings of the firm from the provision of the services are equal to the present value of the total costs incurred by the utilities in providing the services, including the projected costs. This is done using the incremental development cost principle. In practice the tariff is set to the efficient company model considering a technically possible minimum cost of operation for a given quality of service provision that meets the norms and standards set by the regulator. Figure 1 on page 9 shows the tariff setting process within the context of the principles discussed above.

3.3 The efficient model company

We have considered the major principles upon which Chile's water and sanitation tariff is based and have established that Chile's new water regulation is based on the efficient model company. This section analyses the major microeconomic foundations of the model and compares the model with its widely used alternatives: internal rate of return and price cap regulations.

3.3.1 The concept and rationale of the model company

The model company used in the Chilean water and sanitation sector is a computer-simulated or fictitious company that is designed to provide water and sanitation services efficiently, within the context of the norms and standards set by the regulator and considering the geographic, demographic and technological factors that affect its operation. The central reason for building the efficient company model as a substitute to the formerly used regulation based on the rate of return was to create a benchmark as a basis of comparison in order to correct the previous inefficiencies.²⁴ As Gómez-Lobo (2001b) points out, the efficient model company can be thought of as a solution designed in response to the challenge of building a new company, starting from zero, in order to satisfy water and sanitation demands efficiently. Thus the efficient company model consists of:

- *institutional and administrative schemes* needed for efficient provision of water and sanitation services, considering, for example, the operational integration of water and sanitation services to take advantage of economies of scale and lower production costs; and
- *physical schemes* that affect the cost of service provision. These schemes need to take into account the geographic and demographic particularities of the areas of operation and the technological choices available to the real companies. In other words, the model company does not entirely detach itself from the technological and the physical barriers that real companies face and indeed is detailed enough to capture all such important features in the model.

The rate of return regulation mechanism was adopted by Chilean water and sanitation sector until the beginning of the 1980s.²⁵ The rate of return (ROR)

²⁴ Gómez-Lobo and Vargas, 2001.

²⁵ Bustos and Galetovic, 2001.

regulation allows the regulated public utilities to generate sufficient income to cover their cost of operations, depreciation of capital equipment and a specified rate of return on invested assets. Conceptually and methodologically the rate of return regulation is not cumbersome, although determining the tariff rate under this regulation is not an easy task and is often controversial. The main source of controversy is how to define and value an asset base for the water and sanitation utilities: whether to base the value on the original historical cost or on current market prices.²⁶ Similarly valuing depreciation may also be controversial. Moreover, ROR has some major structural flaws such as a high incentive for over-investment, or gold-plating, and little incentive to control costs. In addition to these inherent problems of ROR, the populist approach of the government in Chile (similar to most developing countries) had under-priced the services for residential customers. As a result the utilities had faced severe financial constraints and inefficiency, although a combination of cross-subsidy and direct subsidy from the central government was available.

The efficient firm model was therefore established to solve these problems simultaneously by allowing the utilities to self-finance their operational and investment costs while at the same time providing incentives for efficiency.²⁷ Unlike other efficiency pricing mechanisms which merely intend to equate tariff with long-run marginal costs, the efficient company model takes into account dynamic efficiency whereby the long-run marginal cost used for setting the tariff is indeed the potential minimum cost. In a competitive market efficiency is not an issue as competitive forces make sure that companies operate with the minimum cost. However in a non-competitive market this is not the case and inefficiency is a primary problem. The efficient company model plays the role of a competitive force dictating that the water and sanitation utilities can sustain their operation only by being as cost effective as the model company. To formalise and appreciate this assertion the following section compares the efficient company model with its widely used alternatives: the rate of return and price cap regulations.

3.3.2 Comparison of the efficient model company with rate of return and price cap regulations

A very important means of comparing different regulatory approaches is an analysis of the incentive power for efficiency embodied in the regulations. Gómez-Lobo (2001b) persuasively demonstrates that a regulation's power for incentive is entailed in the relationship between the tariff set under the regulation and the cost of providing the service. In the particular case of water and sanitation, this assertion implies that the incentive power of a particular regulation depends on the responsiveness of the tariff to changes in the cost of providing the water and sanitation services at a given standard and norm.

²⁶ According to Bustos and Galetovic, 2001, in Chile the most common approach in valuing the asset involved negotiations between the regulators and the utilities to determine which costs of assets are acceptable, evaluating them on the historical cost.

²⁷ Bustos and Galetovic, 2001:4.

Using this criterion we would first evaluate the rate of return regulation. Under the rate of return regulation the water and sanitation companies are allowed to cover their costs on operation, depreciation and investment as well as a certain fixed rate of return on invested assets. This implies that under the rate of return regulation an increase or decrease in the cost of water and sanitation service provision is immediately reflected in the tariff. Technically speaking, this means that there is a perfectly proportional positive relationship between the tariff and the cost in that whatever the change in cost is, it would automatically be transferred to the tariff.²⁸ This situation can easily be shown symbolically as:

$$\frac{\partial P}{\partial C_{R\&P}} = 1$$

where the symbol $\frac{\partial P}{\partial C} = 1$, read as the derivative of price with respect to cost, shows that the change in price (tariff) due to change in cost is one.

To fully appreciate this scenario it is vital to recognise that minimising the cost of operation in general involves cost in terms of managerial effort and employee productivity. And as we mentioned above the response of price (tariff) to changes in cost is automatic, at least theoretically, under the rate of return regulation. The implication is that the costs incurred by water and sanitation utilities (regulated under the rate of return regulation) for the purpose of reducing the costs of service delivery would remain uncompensated by the tariff, as the tariff would fall immediately in response to the fall in cost. Similarly, an increase in the cost of operation, due for example to managerial negligence and overall production inefficiency, would normally be translated into higher tariffs. Whatever cost decisions are taken by the water and sanitation companies, the resulting benefit or burden is entirely absorbed by consumers with absolutely no effect on the utilities. It is therefore unequivocally clear, at least from a theoretical perspective, that the rate of return regulation provides very little incentive for the efficient provision of water and sanitation services.

Moreover, other undesirable elements of the rate of return regulation, such as input inefficiency and lack of technological dynamism that stems from the explained low incentive power for efficiency, are well-documented in the modern regulation literature. Input inefficiency results from the company's choice to use more capital relative to other inputs than is most efficient to produce any given output. This is the well-known Averch-Johnson effect and is a rational choice for the utilities to make as their profit depends on their asset base rather than the cost of operation. In fact a company has an incentive to produce inefficiently and pay more rather than less for capital equipment in order to maximise the value of its assets – a case well-known in the literature as gold-plating. The second undesirable problem, the lack of technological dynamism, refers to the lack of incentive for the company regulated under rate of return regulation to be involved

²⁸ In practice, however, a transfer of this nature is not automatic and may involve several years of legal proceedings.

in technological (as well as administrative) innovations that would minimise the cost of service delivery. This adverse behaviour is in fact straightforward in that benefits accrued from cost effective measures by the companies would quickly be wiped out by lower tariffs.

Therefore, in general the rate of return regulation provides little incentive to the regulated companies to produce efficiently. In response to this lack of incentive, price cap regulation was innovated and has become prominent since the 1980s. The central idea behind price cap is to fix the tariff rate for a specified period of time (usually 4 to 5 years) so that the change in tariff associated with change in operation cost would be zero during the tariff period. This is shown symbolically as:

$$\frac{\partial p}{\partial C_{\text{price-cap}}} = 0 \quad \text{for the tariff period}$$

Thus, price cap represents a high powered incentive for production efficiency in that the regulated companies have a high incentive to benefit from cost-effective measures within the tariff period as it would not be transferred to consumers via a lower price. Similarly if the operation cost of the regulated companies is above the fixed tariff then the company would bear the loss since the fixed tariff does not allow it to transfer the cost to consumers. Thus, in order to sustain its operation the company is left with only one choice: to align its cost at least to the level of the tariff.

Under price cap regulation initially the tariff level is determined to reflect an "optimal level" price that would allow efficiently operating water and sanitation utilities to cover their costs fully. Unlike the rate of return regulation that considers historical costs, price cap regulation considers projected costs in the future, taking account of dynamic efficiency gains. This implies that the benefit of dynamic efficiency or cost reduction measures is limited to the duration of the fixed tariff and would ultimately be transferred to consumers via lower tariffs in subsequent tariff revisions. In fact one of the central assertions behind price cap regulation is the fact that the transfer of dynamic gains from the water and sanitation utilities to consumers at every tariff revision (4 to 5 years) provides firms with incentive to further cut cost at every revision in order to continue making profit and to sustain their operations. This transfer of gains is believed to ensure ultimately that the operation costs of the companies would align to the (potentially) minimum level.

To ensure this the regulators need intensive information from the companies on cost, demands and other relevant variables to project the efficient cost for subsequent tariff terms. However, when the utilities gained dynamic efficiency and reduced the cost of operation (leading, in theory, to a reduction in the subsequent tariff terms), they would choose not to reveal this information to the regulators so that they would continue benefiting from higher tariffs.²⁹

²⁹ This is a classic example of the principle-agent problem.

Information asymmetry of this sort is a major problem in price cap regulation and somehow compromises the efficiency power of the price cap regulation in practice. The implication is that due to asymmetric information, little or no benefit from the dynamic efficiency attained by the companies may be transferred to consumers. This is represented symbolically as:

$$0 < \frac{\partial p}{\partial C_{\text{price-cap}}} < 1$$

implying that certain proportions of changes in the cost of operation may not be reflected in the price of the tariff. The extent of the proportion obviously depends on the degree of the information asymmetry. The higher the asymmetry the lower would be the reflection of cost in the price. Similarly, the lower the asymmetry the higher would be the response of price to changes in cost.

The efficient company model in Chile was designed to address the information asymmetry problem that weakens the incentive power of the regulation in price cap regulation. The company model does so due to its design. It retains the high incentive power of price cap regulation while alleviating problems of information asymmetry. The high incentive power of the model is due to the five year time span allowed for a tariff term. At the same time the asymmetric information is corrected through the design of the model company: unlike the price cap regulation, optimal projections of costs, demands, investments and other variables could be made independently by the regulator with little reliance on the real companies. This means that the change in price associated with change in cost of the efficient company model is zero within a tariff span. However, the change is equal to one at the time of tariff revision. This is represented symbolically as:

$$\frac{\partial p}{\partial C_{\text{model}}} = 0 \text{ for the span of a tariff period.}$$

Hence the efficient company model has a high incentive power, similar to the price cap regulation. However, unlike the price cap regulation, under the efficient company model the regulator has full information (though not entirely accurate, in practice) regarding the change in cost that comes from efficiency gains that would be passed to consumers at the end of every tariff period. Symbolically this can be modelled as follows:

$$\frac{\partial p}{\partial C_{\text{model}}} = 1$$

Although the Chilean efficient company model retains the theoretical high incentive power of price cap regulation, many researchers see evidence of some behaviour of yardstick competition. The yardstick competition component is attributed to the fact that tariffs are set for the hypothetical model firm and therefore, to sustain its operation financially, the actual utility has to be at least as

cost-effective as the model firm. The model firm in essence serves as a benchmark for comparative competition. However, there is a subtle difference between the model company regulation and yardstick regulation. Under the efficient company model the optimum operation cost is generated from the model and is directly determined at every tariff revision, whereas in yardstick regulation the optimal cost is intended to be achieved through dynamic competition while the regulator has no information of the potential minimum cost.³⁰

But how reliable are the results and projections made from the company model independent of real companies? This is indeed a very important question and has been hotly debated by scholars, though at a theoretical level.³¹ In practice the efficient company model cannot be modelled without information from real companies since it is the real companies that have better knowledge of the costs, demands and technology they face. Despite what was originally intended, the efficient model company does not entirely solve the problem of asymmetric information. Nonetheless, serving as efficient yardstick competition, the efficient company model has enabled the regulator to obtain better information from the real companies than would have been possible under the price cap regulation. This is due to the prompt conflict resolution mechanism embodied in the tariff administration procedure, discussed briefly in section 5.

The efficient model company regulation that has been used in Chile is superior to the other regulations in the ways explained above. However, the model company regulation has its own flaws that may make it difficult to be easily implemented elsewhere. As Gómez-Lobo and Vargas (2001) point out, this regulation has some major shortcomings:

- Its technical complexity makes the regulation more "confusing" (p.20) and the "amount of information that is due to be analyzed, the [large] number of variables and parameters that must enter the model and the computational complexity of the model ... make [it] a black box, where it is not easy to know how certain parameters are influenced in the final results."³²
- Building the model is very expensive in terms of money and time.³³
- Until the last few years the Chilean water and sanitation sector had no system of standardised regulatory accounting, giving more emphasis to the parameters that are projected using the efficient company model. This means that it is difficult to find consistently defined data on the operation costs of the real companies. However, this is not a serious problem as it could be avoided by developing a standardised accounting system.

³⁰ Gómez-Lobo and Vargas, 2001.

³¹ See Bustos and Galetovic, 2001.

³² Gómez-Lobo and Vargas, 2001:20 (author's translation from Spanish).

³³ For example, Gómez-Lobo, 2001b, mentions that the development of the model for an important sanitation company costs about US\$ 200,000 in consultation fees.

4. Administration of the regulation

Thus far we have recognised that the efficient company model has advantages in providing incentives for efficient production as well as in bridging information asymmetries. We have also mentioned the fact that though it was hoped the model company would do so with little reliance for information on the important variables and parameters that enter the tariff computation, in practice the model demands intensive information from actual companies as they are better informed about the costs they incur, the demands they face and the investments they would make. Despite this, however, the model has the advantage of forcing the companies to release more detailed and quality information than would otherwise be possible. With this background let us now see how the tariff is practically determined and regulated.

In Chile the water and sanitation tariff is determined and regulated under clearly identified, well-defined and transparent legislation that explicitly defines the procedures to be followed.³⁴ These procedures clearly identify the process of computing the tariff, the time span for each phase of the tariff process and the procedure for settling discrepancies in tariffs between the regulator and the water and sanitation utilities.

According to Chavez and Quiroga (2002a), the administrative process of the tariff determination in Chile involves the following steps:

1. Twelve months before the expiration of the current tariff, the regulatory agency, SISS, presents the water and sanitation utilities with the "terms of reference" for the tariff studies. These terms of reference "identify the systems to be studied, ... the criteria for optimisation to be applied on the operation and expansion of the systems, the criteria to defend demand forecasts for planning purposes, water quality levels, quality on customer services, methodology to value raw water and the methodology to value the cost of capital."³⁵
2. The water and sanitation companies and the public have sixty days to comment on the terms of reference.
3. The regulatory agency responds to the comments and queries within forty-five days.
4. Five months before the expiration of the current tariff the regulator and the utilities exchange their own tariff studies,³⁶ based on the agreed terms of references.
5. If discrepancies in the studies occur they should be formally presented to SISS within 30 days. The two parties have 15 days to negotiate and reach an agreement. If agreement is not reached, a committee of three experts is

³⁴ Chavez and Quiroga, 2002b.

³⁵ Chavez and Quiroga, 2002b.

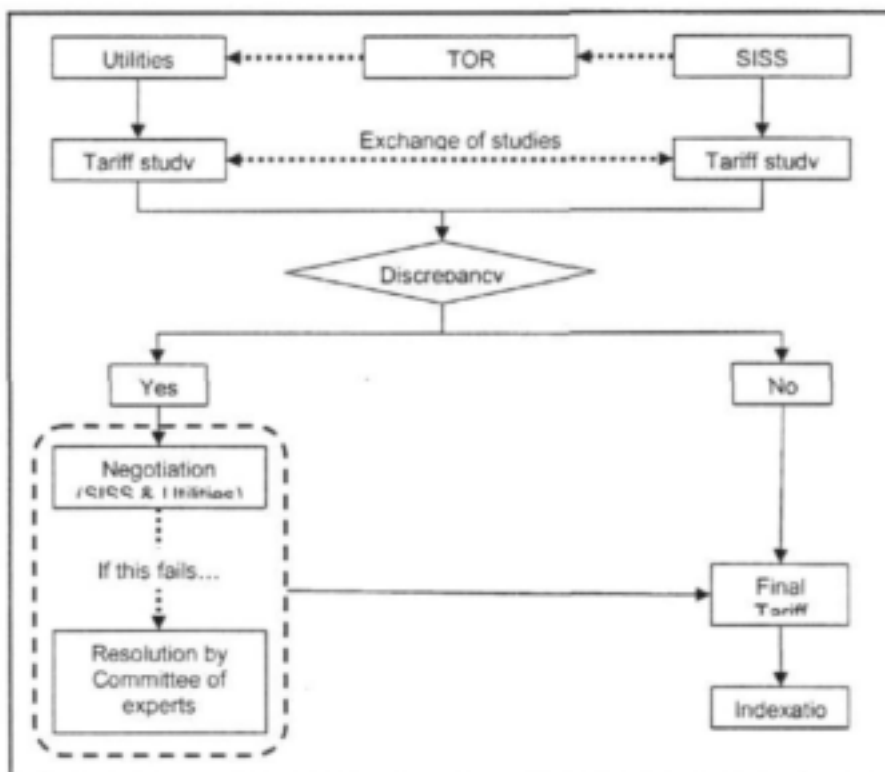
³⁶ The tariff study must contain the conceptual aspects upon which the studies are conducted, the calculus details and the results (Chavez and Quiroga, 2002b:11).

instituted. One of the three experts is chosen by the utility, another one by SISS and a third by SISS from a list of names previously agreed to by the two parties. The committee has 30 days to resolve the discrepancies. The committee's decision is authoritative and cannot be appealed.

6. The process is completed with a public announcement of the new tariff.

The above procedures are shown in figure 2, below:

Figure 2: Administrative process of tariff determination in Chile



The most striking points of the tariff administrative system are the transparency of the procedures and the prompt conflict resolution mechanism built into the system. As Gómez-Lobo and Vargas (2001) argue, the fast resolution of discrepancies is the core component of the administration structure that enables the tariff system to work, distinguishing it from the time-consuming and counterproductive process of judicial appeal common to most countries, including the UK and USA. It is clear that this fast mechanism of conflict resolution is one of the reasons behind the capacity of the Chilean efficient model company in improving asymmetric information. This is because the mechanism strictly requires the committees of experts to take their authoritative decisions within 30 days.³⁷ To persuade SISS or the committee of experts within this short period of time the utilities have an incentive to keep information on cost, investment, demand and other parameters intact and ready.

³⁷ It can be argued that 30 days is too short for the committee to investigate the evidence and tariff studies done by SISS and the utilities carefully, given the complicated nature of the model.

4.1 Metering and billing

The water and sanitation sector reform has enabled utilities to recover full costs not only through tariff increases, but also through improved metering, billing and cash collection. Moreover, the administrative procedures of both payment collection and water metering are clearly and explicitly defined and spelled out in a decree. Among other things the decree specifies:

- what type and technical specification of metering device should be used;
- that consumers be charged for the installation of metering devices, while maintenance and renewal remain the responsibility of the water utilities;
- that meter reading be conducted in a regular cycle of 30 days in the case of monthly billing and 60 days in the case of bimonthly billing, with a maximum variation of 2 days;
- that the period between meter reading and actual billing should not exceed 10 days; and
- that if consumers fail to pay, the utilities can disconnect the service and charge consumers for the full cost of disconnection and reconnection.

5. Water consumption subsidies in Chile

The central component of Chile's water and sanitation sector reform was the change in the tariff structure, aimed at providing the utilities with financial stability and independence. As a consequence, the reform resulted in a sharp rise in the average tariff (from US\$0.16 per cubic metre in 1989 to US\$0.60 per cubic metre in 1998, an increase of almost 400% over a period of 9 years).³⁸

The increase in the tariff was a serious social and economic challenge for poor households. To protect them from this socially unacceptable consequence of the reform, a means-tested direct subsidy structure was introduced in 1990. The subsidy targets the poorest 20 percent of the population.³⁹ Connection was almost universal in Chile, therefore the concern of the subsidy has been consumption.⁴⁰

The subsidy has two explicit objectives:

- To mitigate the social problem that poor households would face as a consequence of the steady tariff increase. The driving force behind this notion is the World Health Organisation's (WHO) principle that no household should pay more than 5 percent of its monthly income in water and sewerage charges.
- To provide incentive for efficient use of water by poor households. This is achieved through the following mechanisms:

³⁸ Gómez-Lobo, 2001a.

³⁹ Serra, 2000:3.

⁴⁰ Alfaro et al. 1997.

1. The subsidy is designed in such a way that households contribute towards their consumption bill. Depending on the level of poverty, the share of a household's payment can range from 25 to 75 percent of the total bill for the first 15 cubic metre consumption of water, with any consumption above that fully paid by the households.
2. The criteria for eligibility includes that the households should have no arrears with the public utilities and should have a good record of paying their share of the bill on time. This has had a huge financial advantage for the water utilities which for example have cut arrears from 7.9 percent in 1990 to 2.9 percent in 1994.⁴¹ The subsidy policy provides a high incentive for prompt payment of water and sanitation bills.

The direct subsidy scheme has replaced the previous cross-subsidy scheme. Unlike the cross-subsidy scheme, under the direct subsidy mechanism eligibility is based on the socio-economic assessment of each potentially eligible household. To be eligible households must first apply to the municipalities, which in turn carry out surveys to determine the social condition of the households applying for the subsidy. The survey is done based on the eligibility scoring system known as CAS (*Comités de Asistencia Social Comunal*: The Communal Social Assistance Committee). Households are classified according to their CAS score with the poorest family (a family with the lowest CAS score) receiving the highest rate of subsidy with first priority.⁴²

Box 1: Determining eligibility for subsidies

An eligibility scoring system called CAS is the main targeting instrument used in Chile for distributing means-tested subsidies. It produces a score for each household wishing to be evaluated based on a personal interview at their dwelling. The questionnaire used includes 50 questions on general information, identification of household members, living conditions, crowding conditions, health conditions, comfort, occupation and income, ownership of durable goods, and other socio-economic variables. Once the interview is conducted and the CAS score calculated, the score is valid for two years, and the household can use it to apply for many different subsidies. Besides the water subsidy, eligibility for pension payments, family subsidy, free health benefits, and other subsidies are determined on the basis of the CAS score.

Many municipalities outsource the interview to private survey companies, but still calculate the CAS score. This lowers the risk of collusion between interviewers and households, since interviewers do not know the exact relationship between a household's answer and their CAS score.

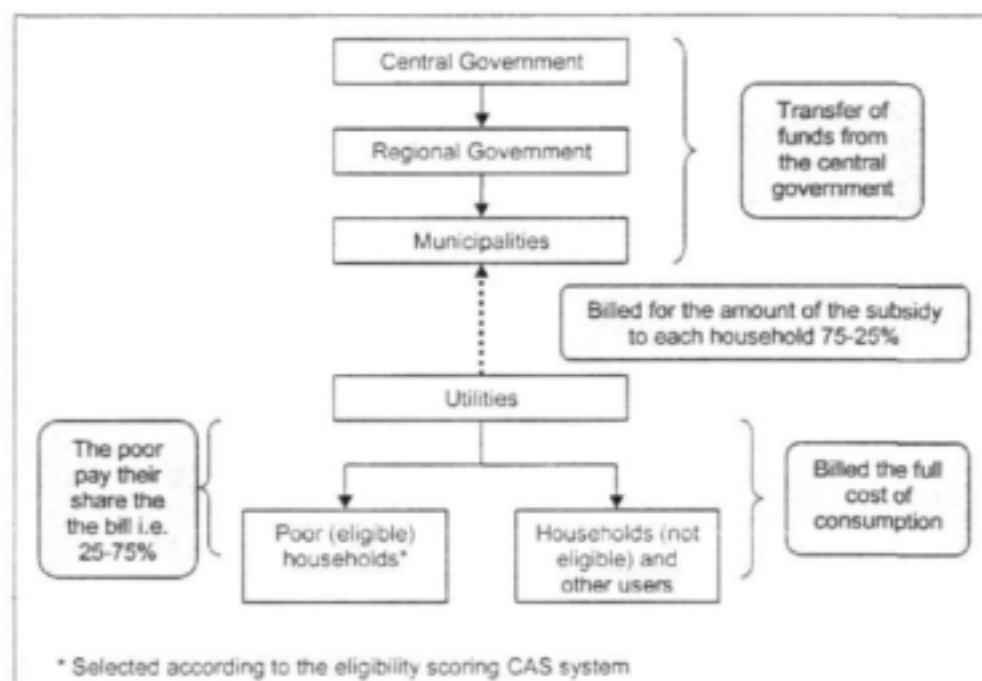
Source: Gómez-Lobo (2001a:2).

⁴¹ Serra, 2000:8.

⁴² Alfaro et al, 1997.

The subsidy is entirely funded from the central government budget that is directly transferred to the municipalities, to be distributed accordingly. The practical procedure is as follows: the municipalities transfer to the water utilities the list of names of eligible households along with the rate of subsidy they are entitled to. Based on this, the water utilities charge the respective households their share of the water consumption bill with over-consumption charged fully, while the municipalities are invoiced for the respective subsidies. Figure 3 below provides a schematic representation of the subsidy procedure.

Figure 3: Schematic diagram of Chile's direct subsidy system.



The subsidy is earmarked and cannot be used for alternative purposes by the municipalities. Moreover, to ensure prompt transfer of the subsidy to the water utilities the law allows the following:

- The utilities can charge the municipalities interest on late payments and the municipalities must bear the charge on the interest, as it would not be reimbursed by the central government.
- The water utilities can charge the households the full amount of the bill on the next payment period; if the bill is not paid, discontinuation of services can follow.

Hence the municipalities have no incentive of withholding or delaying the payments as it could lead to financial and political loss.

Box 2: Evolution of the subsidy law

Since its introduction in 1990 the subsidy policy has gone through substantial changes. When it was first introduced the subsidy targeted the poorest urban

households, defined as the poorest 20 percent in each region. The subsidy covered 50 percent of the bill for the first 10 cubic metres of consumption. Moreover, the eligibility criteria included that the household had no arrears with the water utilities and had consumption of less than 20 cubic metres per month. At the end of 1990 the recipients of the subsidy made up only about 14.1 percent of the targeted population. As a result the subsidy law was considered stingy and was subject to several amendments:

1991: A new subsidy range of 40 to 75 percent for 15 cubic metres of water consumption was introduced to provide greater financial relief. Moreover, the 20m³ restriction was avoided; the no-debt requirement was suspended until the end of the year. As a result [of the previous no-debt requirement] the subsidy had covered only 42 percent of the desired target households.

1993: Subsidies that differentiate between regions were introduced. Regions with high water cost obtained a 75 percent subsidy, regions with low water costs continued to receive the 50 percent subsidy and intermediate cost zones obtained 60 percent.

1994: The subsidy was amended to include socio-economic need as a determining factor. The range was widened to between 25 and 85 percent and the maximum "subsidisable" consumption was increased from 15 to 20m³. In the same year the definition of the targeted population was changed to the poorest 20 percent in the nation rather than 20 percent of the poorest in each region. This amendment was introduced to divert more resources to the poorest regions.

1996: The socio-economic condition of the region and the rate zone to which the beneficiary belonged began to be used in calculating the subsidy rate, with the consumption limit for the subsidy set at 15m³ per month.

1997: By the end of 1997 the subsidy covered 95 percent of the targeted population.

Source: Serra, P. (2000).

5.1 The benefits of the subsidy

- The subsidy allowed for the tariff rate to rise and reflect the true cost of water, without compromising social and distributional goals.
- The subsidy was very successful in reaching the targeted population (see Box 2 above).
- In terms of monetary values, the benefit of the subsidy is extremely high when compared to its cost. For example, the profit of the water utilities (which prior to the reform had an average deficit of 2 percent of assets) in

1998 alone was about \$107 million, which is three times the cost of the subsidy scheme (excluding administrative costs).⁴³

5.2 Prerequisites for Chilean-type subsidy

- As the subsidy is directly linked to the amount of household consumption, metering is the most important necessary infrastructure for the direct subsidy scheme to be implemented.
- Means-tested direct subsidy requires a high institutional capacity, especially administrative capacity at the municipal level. The administration capacity includes identifying the targeted population group and undertaking surveys based on a well-designed and cautiously administered eligibility criteria. The water utilities also should have strong and reliable administrative capacity to bill separately eligible households and municipalities accordingly. Designing eligibility criteria is a difficult task. The general consensus is that eligibility should reflect a high correlation with the underlying poverty variable of interest, that it should be objectively measured and easily observable, and that it should be difficult to falsify or misrepresent.⁴⁴

As seen from the above, the Chilean-type means-tested direct subsidies, despite their merits, are difficult to implement in most developing countries where institutional and administrative capacities are low. Alternative schemes of subsidy that require less physical infrastructure (metering), and administration and other institutional capacity are recommended for such countries. One major alternative to the means-tested direct subsidy is a zonal subsidy, of which Panama stands out a successful pioneer.⁴⁵

In the zonal subsidy scheme subsidies are allocated to all households living in areas considered to have a high concentration of poverty. As Foster et al (2000) point out, zones of residence, as criteria for eligibility, have the virtue of being easy to observe and difficult to falsify. The risk of inclusion of undeserving households and exclusion of deserving ones could be higher when the correlation between geographical location and poverty is imperfect and when the zone considered is large. To minimise this problem Panama has developed a "poverty map" based on living standard measurement surveys. The major aim of the poverty map is to minimise the risk of inappropriate inclusion and exclusion as much as possible.

6. Some possible lessons for South Africa

- The most important and successful phase of the Chilean water sector reform demonstrates that South Africa can to a large extent improve the provision of water and sanitation services in an efficient manner, primarily by reforming the sector along commercially oriented lines with incentive-based regulation.

⁴³ Gómez-Lobo, 2001a:3.

⁴⁴ Foster, Gómez-Lobo and Halpern, 2000:11.

⁴⁵ Foster, 1998.

- Constitutional separation of regulatory and administrative functions of the water and sanitation sector, coupled with the institutionalisation of an autonomous regulator, was one of the most important and early phases of Chile's reform, which South Africa would do well to emulate.
- Following the example of Chile, South Africa needs to ensure the implementation of transparent and detailed regulatory policy and administrative procedures that separate and clearly define the roles and obligations of each party involved. The policy and the procedure should explicitly address the scope and parameters of interaction between the utilities, the regulator and consumers. Most importantly, policy and procedure should ensure the quick resolution of conflict by explicitly addressing how, by whom, and how fast discrepancies shall be resolved.
- For the purpose of setting "efficient" water tariffs, Chile uses a fictitious model company for each actual company, on the assumption that the model company operates efficiently within the constraints of demographic, geographic and technological features. The models promote high productive efficiency despite their complexity and the high level demand on institutional and administrative capacity. To ensure optimal tariffs along commercial lines it is highly recommended that South Africa should in the medium term consider building simpler model firms that could serve as benchmarks, at least for the larger water utilities.
- Although the Chilean-type means-tested direct subsidy has the advantage of reaching the targeted population with minimum risk of resource leakage to unintended users, it demands universal metering of water consumption and high administrative and institutional capacity, which South Africa lacks at present. Nonetheless, Chile's clearly defined, well-designed and well-administered criteria-based subsidy structure is something that South Africa would do well to study with a view to possible adaptation and implementation. Alternatively, South Africa may benefit a great deal by adopting Panama's model of zone-based subsidy, as this can be achieved relatively easily by drawing a poverty map based on living standard surveys or Census data.

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ANNEXURE D

**Economic regulation of water in Johannesburg –
A case study**

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1. Introduction

When this case study was designed, the idea was to draw lessons on the economic regulation of water services in Johannesburg. However, as the research was being undertaken it became clear that the economic regulation methodology of water services in Johannesburg was not as developed as it was initially expected. The city was still grappling with institutional arrangements that would support regulation. It is out of this exercise that the City is building capacity to develop the economic regulation methodology.

It was decided that understanding and recording the Johannesburg's Contract Management Units experience in evolving an approach to service regulation and identifying lessons for other municipalities who wish to improve service regulation would still be a useful contribution.

The case study, therefore, took the form of investigating and recording the genesis of Johannesburg's approach to service regulation. The case study begins by looking at the traditional model of service delivery in Johannesburg. It then records how the change in the service delivery model resulted in the need to improve regulatory capacity and how this regulatory capacity has been evolving over time.

2. The service delivery model

2.1 The historical (traditional) service delivery model

Historically, Johannesburg, like many other municipalities, has not only been responsible for developing service related policies and by-laws and overseeing their implementation, it has also been responsible for providing services. In the language of the contemporary South African local government policy discourse, Johannesburg has traditionally been a service authority and a provider of municipal services.

2.2 The emergence of a new service delivery model

Towards the end of the 1990s, Johannesburg started a process of developing a new vision of a streamlined administration. This vision was captured in Igoli 2002 and Igoli 2010. Part of the vision was to separate the service authority function from the service provider function. The city established utilities, agencies and companies (UACs) as vehicles of service delivery while it remained the service authority as required by law. These UACs are owned by the City of Johannesburg, but are operated as independent business units providing services to customers on behalf of the City.

The introduction of the new service delivery model crystallized three key roles for the City regarding service delivery:

- i) Ownership of the means of service delivery

- ii) Client to the UACs which deliver services on its behalf; and
- iii) Responsibility to regulate the way services are provided as a government in its municipal area.

The City of Johannesburg also provides some key corporate services such as customer relations, billing and fleet management (the latter through an external services provider) to some of the UACs. Therefore it can be argued that the City of Johannesburg has a fourth role, that of a *service provider to the UACs*. However, this is more from the point of view of UACs than from City's point of view even though it must be noted that inefficiencies in these services can affect the UACs and hence also consumers.

While the city has always had the responsibility of being a "regulator", being a service provider meant that this regulatory role was not prioritized. Council made policies (informed by its governance responsibilities) and the supporting administration implemented these policies.

In terms of the new service delivery model, it is important that the city play a much more effective role as regulator. In response to this challenge the Contract Management Unit (CMU) was established. The CMU was set up to provide expert support and capacity to Council to fulfill its new role as regulator.

This decision conformed to the Municipal System Act (S81) requirement that Municipalities rendering services through an "external mechanisms" had a responsibility to ensure that:

- there is a service delivery agreement (SDA);
- services are provided in accordance with the Council IDP;
- monitoring is in accordance with the PMS; and
- there is comprehensive reporting to council.

2.3 The CMU's mandate

The mandate of the CMU was defined as follows:

- Monitor and evaluate UACs against their service delivery agreements (SDAs) and Business Plans Key Performance Indicators (KPIs), etc.;
- Act as the City of Johannesburg custodian for the portfolio of UACs and advise the City on UACs' performance and progress towards established targets;
- Develop database of relevant benchmarks and UAC information to entrench a performance mindset in the UACs;
- Provide reliable, accurate information to the City for the purpose of strategy formulation and decision making; and

- Manage a healthy relationships between the shareholder (City of Johannesburg) and the UACs.

2.4 Organizational arrangements

In the context of the new service delivery model, the city was faced with an organizational challenge of supporting and servicing this model both politically and administratively.

At a political level, there was no custodian of the owner/shareholder responsibility. Council Committees were responsible for the client and regulatory roles.

At an administrative level, there was no formal delegation of the owner/shareholder expert support responsibility. However, the Finance Directorate, by virtue of it being responsible for decisions regarding capital expenditure and tariffs, was the *de facto* administrative custodian of this responsibility. The Contracts Management Unit became the administrative custodian of the client and regulator responsibilities.

The political responsibility for the client and regulatory role of the services provided by the UACs is divided among four Council Committees. These are reflected in Table 1.

Table 1: Responsibilities of Council Committees with regard to the UACs

Council Committee	UACs
Municipal Service Entities	Johannesburg Water, Pikit-up and City Power
Municipal Enterprises	Fresh Produce Market, Johannesburg Zoo, Civic Theatre, Metrobus and Property Company
Community Development, Roads and Parks	Johannesburg Roads Agency and City Parks
Economic Development, Strategy and Finance	Johannesburg Development Agency and Metro Trading company

This allocation of responsibilities to Council Committees affects the distribution of power among members of the Mayoral Committees who are chairpersons of Council Committees.

2.5 The CMU's interpretation of its mandate

Table 2 shows the way the CMU interpreted its mandate.

Table 2: Functions of the CMU

Function	Key activity
Financial evaluation	To monitor the financial aspects of the Utilities and Council-owned businesses.
Operational Evaluation	To monitor and control compliance in relation to the technical and environmental aspects of the Service Delivery Agreements that Council has with each of the UACs.
Research and Tariff Evaluation	To conduct research in regulatory environments. To undertake economic regulation by means of research and analysis so that the tariff and tariff structures of the Utilities and Council-owned businesses are determined, implemented and monitored.
Compliance and Governance	To monitor and control compliance and governance in relation to the service delivery agreements of the UACs. To provide advice, develop contracts and perform legal research audit and analysis in

	support of the development, maintenance and amendments to Service Delivery Agreements, License agreements that entities enter into with Council.
Outsourcing Contracts	To monitor the outsource contracts that the City of Johannesburg has with the Fleet Contractor and IT outsource partner.
Liaison	To provide a liaison service to the Contract Management Unit and to facilitate relationships between the CMU, the UACs and internal stakeholders.
Data support	To develop, maintain and control the collection, storage and use of all data and knowledge resource materials for the Contract Management Unit.
Records Maintenance	To maintain the records of the Contract Management Unit and ensure access and availability of documents at all times.
Secretariat	To perform a variety of administrative duties so that a full secretarial services is provided to the Contract Management Unit.

2.6 CMU structure

The CMU was structured into four main divisions with the following responsibilities.

2.6.1 Governance and compliance

- Monitor service delivery agreements
- Conduct legal litigation investigations
- Monitor shareholders compacts
- Support the selection of board of directors
- Initiate annual general meetings
- Review and amend articles of association.

2.6.2 Operational evaluation and monitoring

- Monitor technical performance and compliance
- Provide technical input on the operations of UACs
- Conduct Environmental assessments
- Support the development of Bylaws

- Monitor IPP agreements

2.6.3 Research and projects

- Support bench-marking
- Conduct research on tariffs
- Formulate policy frameworks for regulation
- Initiate and co-ordinate projects

2.6.4 Financial evaluation and monitoring

- Monitor and assess the financial performance of each UAC
- Review the financial aspects of the annual business plan of the UACs
- Create standardized financial models
- Develop Financial KPIs for UACs

2.7 CMU capacity

The Unit has very limited in-house capacity. It is largely reliant on external service providers (consultants). This is also demonstrated by the ratio of contracted services expenditure to direct operating expenditure (See Table 3).

Table 3: CMU expenditure: actual and planned

Financial year	Total expenses	Contracted services	Contracted as % of total
2001/2	R16.4m	R11m	67
2002/3	R16.1m	R8.6m	53
2003/4	R16.6m	R8.6m	52
2005/5	R17m	R8.6m	51

3. The emerging regulation model and water services

In an effort to deepen the understanding of the emerging regulatory methodology in Johannesburg, the case study focused on water services.

3.1 Background to Johannesburg Water

Johannesburg Water was established as a water utility company in January 2001. The mandate of the company is to provide water services to customers living or operating in the City of Johannesburg.

The company took over the City's water supply and wastewater assets and more than 2 500 employees from the city. The utility's operations cover 1 650 km². It purchases most of its bulk water from Rand Water, stores it in over 100 reservoirs and water towers and reticulates it through 9 500 km of distribution pipes. The utility collects wastewater through 9 000 km of sewers and treats it at six treatment plants.

Johannesburg Water undertakes the functions of metering, billing and collection for top commercial customers. Metering, billing and collection for other customers are done by City of Johannesburg. However, Johannesburg Water intends to assume progressive control over meter reading and customer relations. At the same time a Revenue Share Services Center will be established and given the responsibility for billing and revenue collection functions.

In the financial year 2002/2003, Johannesburg Water had a turnover of R2 billion per annum, 2 557 salaried employees and a salaries and wages budget of R283m.

3.2 Governance and management of Johannesburg Water

3.2.1 The Board and the City

City of Johannesburg is the sole shareholder of Johannesburg Water. The City appointed an independent Board of Directors that governs Johannesburg Water. There are eleven directors, one of which is an executive director. There are no Councilors among the directors.

Technically, the Board is accountable for Johannesburg Water but the Executive Director has to report certain things through the CMU and the Municipal Services Entities Section 80 Committee to the City. This creates a situation where the Executive Director reports to both the Board and the City. Currently the company operates based on consensus between the Board and the City taking into account that the board is eventually accountable to the City as a sole shareholder.

3.2.2 Responsibility for economic decisions

While Johannesburg Water, based on a business plan, is able to influence investment and tariff decisions (which are central to economic outcomes, costs, efficiency of service provision, prices, financial sustainability, the level of return on assets and profits), these decisions are finally taken by the City through its centralized budgeting process based on its overall requirements.

Two questions arise in this context:

- Who should be the focus of regulation in Johannesburg? Should it be Johannesburg Water or the City of Johannesburg?

- Is the City applying some form of economic regulation to Johannesburg Water in this way? Alternatively, has it taken away the responsibility for economic decisions from Johannesburg Water?

3.2.3 Contractual relationships between Johannesburg Water, City of Johannesburg and other related organisations

The city entered into two contracts with Johannesburg Water. These are the

- Sale of business agreement, and the
- Service delivery agreement.

Both agreements were in the process of being refined in the course of 2003.

On 1 April 2001, Johannesburg Water entered into a five-year management contract with JOWAM. Under this contract, JOWAM fulfills various executive management functions. The management contract provided an initial team of 13 managers reducing to two over time. The managers provide expertise in critical areas while the capacity of the utility is being developed. JOWAM assumes operational risk under this performance-based contract.

Johannesburg Water assumes the responsibility of succession planning and skills transfer during this period.

There is no contractual relationship between City of Johannesburg and JOWAM even though the council "identified" the company. Dynacon audits the performance report of JOWAM. This is meant to be a service to board of Johannesburg Water. However, the City's Contract Management Unit also considers this a useful and necessary resource for its own purposes

City of Johannesburg entered into a sale of business agreement with Johannesburg Water. The agreement covers the sale of assets, assumption of liabilities and transfer of staff. At the time of entering into the agreement, the value of the City of Johannesburg water services assets was not known and efforts to get the assets' current value have not been successful.

The sale of business agreement includes a clause allowing City of Johannesburg to control Johannesburg Water's and other companies bank accounts to enable it to transfer funds from company accounts in surplus to those in deficit on a daily basis in order to minimize interest payable to each of its companies on short term loans and overdraft.

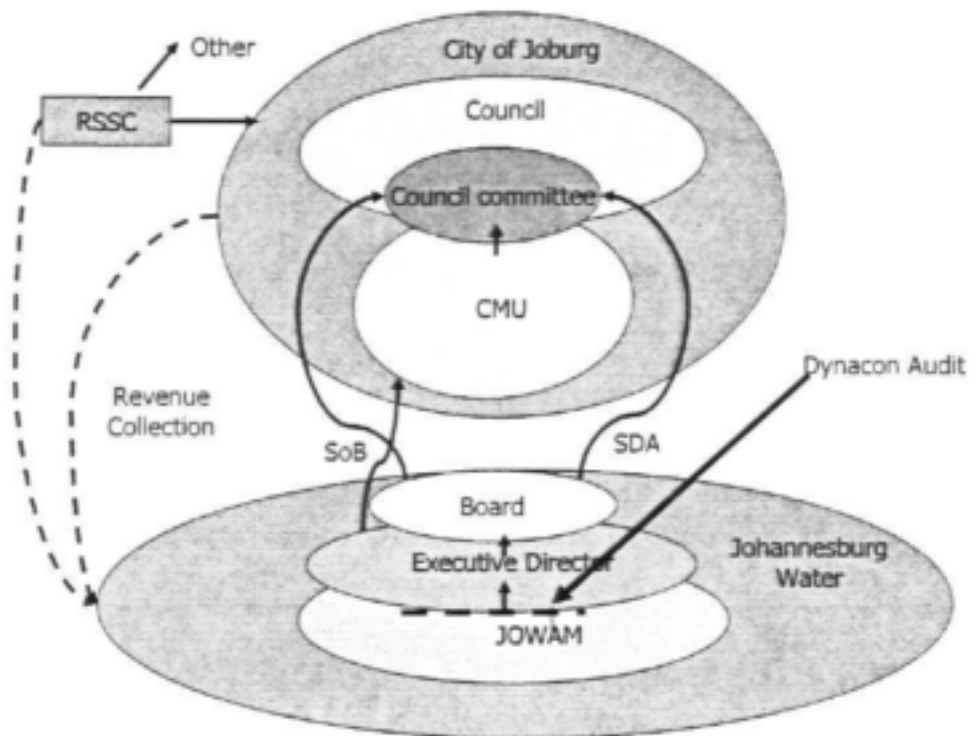
Johannesburg Water is party to a fleet management contract entered into by the City of Johannesburg that provides services to the UACs.

The utility also has a revenue collection contract with the City in which the city reads meters and collects revenue for the bottom 85% (by volume) of the company's customers. The intention is that the company will take over meter reading for all its customers but revenue collection will remain the responsibility of the City and will

later move to a Revenue Shared Services Center that is being established to service all revenue collecting UACs.

Figure 1 below captures the relationships between the structures of the city and Johannesburg Water as they were originally designed.

Figure 1: Organisational arrangements



3.3 Key Issues

The most important issue with regard to economic regulation is the ambiguity presented by the role of City of Johannesburg versus Johannesburg Water in water services related economic decisions. It makes it difficult to conclude that the City of Johannesburg is implementing economic regulation with respect to Johannesburg Water, at least in the conventional sense. When the city is responsible for both tariff and capital investment decisions through its normal budgeting process, it can be said that it is the City that is responsible for economic decision making not Johannesburg Water. All that Johannesburg Water does is to make proposal through its business plan and the final decision rests with the City. In which case, it can be argued that it becomes unnecessary to apply economic regulation to the utility. Rather, another regulatory mechanism should apply economic regulation to the City.

However, an alternative view can be that this is a form economic regulation that gives the City power to determine the key economic decisions that the utility is making through its business plan. The key question is how significant is the business plan in the decision making process?

In any case, in developing its business plan, Johannesburg Water must take into account both the public interest and the shareholder interest if its business plan is likely to get the support of the City. The following diagram extracted from the business plan illustrates how the utility attempts to factor in the different interests.

Figure 2: Johannesburg Water's business plan concept (Source: JW Draft Business Plan 2003-5)



4. Restructuring the regulatory arrangements

4.1 Lessons from the review

A year after these arrangements were put into place, the City conducted a review of their adequacy. The review focused on the functionality of the CMU.

The following issues came out of the review:

- The CMU was performing three distinct support roles to the City of Johannesburg (as shareholder, as client and as service authority);
- There was more clarity about the nature and scope of these three roles than there had been when the CMU was established;
- The CMU was inadequately resourced both financially and in terms of in-house expertise to fulfill these roles;
- The shareholder role on one hand, and the client and regulatory role on the other hand, cannot be handled by a single unit because of the inherent conflict of interest between these two roles;

- The shareholding responsibilities were not formally allocated within the political and administrative spheres of the municipality even though the CMU played a caretaker administrative function.

4.2 Redefining the shareholder, client and service authority functions

As a result of the review of the CMU experience, the structure and roles of the CMU were redefined.

4.2.1 Redefined client function

The responsibilities of a redefined client function include:

- a) Monitoring and evaluating *operational compliance* of all aspects relating to the provision of municipal services as set out in the SDAs such as:
 - Environmental compliance;
 - Procurement compliance;
 - Technical compliance;
 - Compliance with legislation and bylaws;
 - IPP agreements as to City Power; and
 - Providing technical input on operations.
- b) Monitor and evaluate *financial matters* related to the SDAs, such as ensuring sufficient revenues to cover operating expenses;
- c) Monitor and evaluate the municipality's compliance with its own responsibilities in terms of the SDAs;
- d) Undertake research on bench-marking and tariff methodologies;
- e) Facilitate approval of annual business plans in respect of key performance areas, compliance with the UAC policies, requirements of the SDAs and service delivery targets; and
- f) Ensure implementation of UAC policies through annual business plans and tariff setting.

4.2.2 Redefined authority function

The responsibilities of a redefined authority function include:

- a) Complying with legislation;
- b) Making policy in terms of the Constitution and legislation;
- c) Adopting bylaws;
- d) Developing a tariff policy and approving tariffs;
- e) Planning;

- f) Setting Standards for service delivery;
- g) Appointing service providers;
- h) Issuing licenses; and
- i) Performing other core functions such as social development, health and police.

It is notable that many of the above functions are being fulfilled by the City in different ways. However functions related to the following suggested a need for a CMU:

- a) monitoring and compliance issues such as tariff determination and evaluation
- b) research and benchmarking;
- c) issuing of licenses (in the case of solid waste);
- d) determining service delivery standards and monitoring thereof;
- e) environmental compliance in relation to the UACs.

4.2.3 Redefined shareholder function

The responsibilities of a redefined shareholder function include:

- a) Providing strategic direction to UAC boards of directors in respect to matters such as expansion and continuation of management contracts;
- b) Determination of the profile of board of directors (skill, expertise, etc.);
- c) Appointment, assessment and removal of directors;
- d) Approval of a policy on the remuneration of directors and setting of director's conditions of employment;
- e) Attendance of and voting at Annual General meetings;
- f) Appointment of Auditors;
- g) Approval and amendment of Articles of Association;
- h) Approval of Dividend Policies;
- i) Risk Management;
- j) Approval of borrowings;
- k) Approval of annual financial statements;
- l) Approval of Directors Report; and
- m) Approval of Annual Corporate Plans (which includes the dividend policy, financing arrangements and risk management).

4.3 The new institutional arrangements to oversee UACs

The redefinition of the content of the three responsibilities led to a rethink of the organisational arrangements.

4.3.1 The revised shareholder function

The city decided to separate the shareholder function from the client and authority functions. At a political level, the Executive Mayor would have delegated powers as a shareholder and would establish a Shareholder Advisory Committee comprising of the:

- Executive Mayor
- MMC – Municipal Service Entities
- MMC – Municipal Enterprises
- MMC – Community development, Roads and Parks; and
- MMC – Economic Development, Strategy and finance.

The Committee would include the following compulsory attendees:

- The City Manager
- The Executive Director finance
- Head of the Shareholder Support Unit
- Head of Contracts Management Unit; and
- Two external experts who are not permanent member of the committee but may participate per invitation from time to time.

It was intended that the Shareholder Advisory Committee and UAC Boards of Directors relationship would mirror the analogous relationship between a holding company Board of Directors and the Boards of its subsidiary companies.

At an administrative level, the City Manager would establish a separate unit called the Shareholder Unit. The Unit would report to the City Manager through the Executive Director of Finance.

The Shareholder Unit would be responsible for corporate governance compliance, financial evaluation of UACs and portfolio management. It would accordingly have corporate governance; finance and business strategy sub-units

The functions of the sub-units were stated as follows:

Corporate Governance

- Determination of the profile of board of directors (skills, expertise, etc);
- Appointment, assessment and removal of directors;

- Approval of a policy on the remuneration of directors and setting of director's conditions of employment;
- Attendance of and voting at Annual General meetings;
- Appointment of Auditors (including forensic);
- Approval and amendment of Articles of Association;
- Monitoring and evaluation of corporate governance matters; and
- Other governance issues such as code of conduct etc.

Finance

- Participation in ALCO – in respect of capital matters relating to service delivery;
- Financial monitoring – to ensure compliance with approved budget;
- Quarterly reporting;
- Monitoring of capital draw downs;
- Approval of Dividend Policies;
- Risk Management;
- Approval of borrowings;
- Approval of annual financial statements;
- Approval Directors Report; and
- Approval the Annual Corporate Plans.

Business Strategy

- Provide strategic direction to UAC boards of directors in respect of matters such as expansion and continuation of management contracts; and
- Deals with all matters of a strategic nature that UACs may want to consider.

4.3.2 The redefined authority and client functions

The two functions would remain political responsibilities of the following Council Committees:

- Municipal Services entities;
- Municipal Enterprise; and
- Community development, Roads and Parks.

At the administration level, a Contracts Management Unit, which would report to the City Manager through the Executive Director Finance, would support the functions. The Contracts Management unit would be responsible for economic regulation and research, contracts

management, and technical research and evaluation. It would be accordingly structured into three units.

The responsibilities of the three units would be as follows:

Economic and regulatory research

- Provision of direct financial and economic analysis support to the Contract Manager, in the SDA negotiation process;
- Undertaking research and policy development in the areas of tariff and fee determination, and willingness-to-pay;
- Coordinating with all other regulators in South Africa; and
- Responsible for implementing Council's tariff policy.

More specifically:

- Conduct economic sector research;
- Develop tariff methodology in relation to tariff policy;
- Evaluate implications of free services;
- Monitoring and Evaluation of tariff models;
- Liaise with other regulatory bodies; and
- Evaluate and set benchmarks.

Contract Management

- Provide overall direction to the procurement and negotiation of SDAs;
- Ensure that contract management (performance monitoring) is conducted on a standardized and documented way; and
- Protect the interest of the Council.

More specifically:

- Oversee operational compliance through SDAs;
- Develop operational reporting requirements;
- Develop monitoring and evaluation mechanisms;
- Monitor operational aspects of UACs;
- Provide overall direction to procurement negotiation; and
- Sector specialists would be brought in through this directorate.

Technical Research and Evaluation

- Overseeing technical research such as engineering specifications and standards including fleet and IT;

- Providing direct technical management support to the Contract Manager, in the SDA negotiation process;
- Undertaking research and policy development in the areas of best practice, benchmarking, and KPIs; and
- Contributing to the development of policy by undertaking needs assessments in the each of the public service areas, and recommending policy options to address needs that are not being met.

More specifically:

- Monitoring environmental compliance in respect of gas, water, solid waste, roads and parks;
- Monitor technical aspects such as infrastructure of UACs;
- Facilitate By-Law requirements of the UACs; and
- Participate in issues of infrastructure co-ordination .

4.4 Funding arrangements and costs

The old CMU had a budget allocation that was determined by the Treasury. There was no transparent basis for the determining the budget. The operational budget of the CMU was R21m for 2001/2002 and R16.7m for 2002/2003

The City is investigating options of financing its regulatory mechanisms through a formula-based budget determination. Among the options being considered are a percentage of the AUCs's budget for the CMU and a percentage of the City's shareholder value in the AUCs for the SMU.

The CMU estimated that it would require R17m in 2003/2004 and R17.6 m in 2004/5 to run its operations.

5. Key issues and conclusions

Are water services in Johannesburg subject to economic regulation?

Economic regulation is concerned with efficiency of investment decisions, efficiency of operations and operating decisions and the role of pricing in promoting investment efficiency and operations. It is also concerned with the distributive impact of pricing and balancing of economic, social and environmental goals and evaluation and regulation of price levels. In other words, economic regulation is concerned with the economic consequences of decisions taken as part of services provision. This implies that the regulated entity is responsible for taking decisions about investments, operations and pricing and that these decision are regulated by an external agency.

In the case of Johannesburg Water, the service provider takes operational decisions. Investment and pricing decisions are taken by the City. However, operational decisions are

strongly dependent on investment and pricing decisions, which implies that, by extension, the City directly influences operational decisions.

It can therefore be argued that economic decision making regarding water services in Johannesburg rests with the City itself with some influence from Johannesburg Water through the business plan. The City of Johannesburg is not, at least in a conventional sense, an economic regulator of water services yet. It can be argued that the CMU is more of a monitoring mechanism than a regulatory mechanism in the context of economic regulation. The City is an economic agent with respect to water services and hence it could be argued that the city itself ought to be subject to economic regulation.

What can we learn from Johannesburg about the process of establishing a viable economic regulatory mechanism?

From the Johannesburg case study, it appears that the levels of maturity of the regulatory institutions determine the levels of maturity of the methodology of regulation. It is only with functioning and reasonably resourced regulatory institutions that a methodology of regulation will evolve. Stable institutions dedicated to the purpose of regulation are needed in order for thinking about the philosophy and methodology of regulation to be given reasonable attention. Attempts at regulating services have helped the City to develop a better understanding of what regulation is all about and to develop the capacity to undertake regulation.

Establishing the regulatory and monitoring mechanisms after the institutions that are supposed to be regulated are established may result in an information asymmetry between the regulator and the regulated entity. The CMU has been trying to "catch up" with Johannesburg Water with respect to key information that is needed to inform key economic decisions. On the other hand, being an operator may mean Johannesburg Water will have access to key management information and the CMU will depend on the reporting arrangements it sets up in order for it to get the information it requires to take sensible economic decisions.

City of Johannesburg being the economic decision maker with regard to water services means that it has a responsibility to balance its shareholder interests, on one hand and its client and regulator (public) interest on the other hand. It requires an institutional mechanism that is capable of managing this inherent conflict effectively. Only time will tell whether the proposed organisational arrangements will adequately serve this purpose.

Other related WRC reports available:

Asset management for the water services sector in South Africa

Stephenson D • Barta • Manson N

It is generally recognised that the development and rehabilitation of the water services sector infrastructure is extremely capital intensive. To maximise the productivity of water services infrastructure assets, a sound understanding of the condition and performance of these assets is needed by those who own or administer them. The ownership or administration of water engineering infrastructure assets in the South African water services sector refers primarily to the following groups of assets:

- state-owned assets administered mainly by the Department of Water Affairs and Forestry
- parastatal assets, owned or administered mainly by water boards and divisional authorities
- municipal/local government assets; and
- community/private assets

Overall, this research project identified that the South Africa water services industry is at present without a unitary infrastructure asset management methodology. However, it is more than ready to implement one. It is believed that the standard procedure compiled in this report and availability of standardised asset register software will add valuable products to the process of implementation of infrastructure asset management in the water services industry.

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