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FEDERAL MINISTRY OF AGRICULTURE & WATER RESOURCES

NATIONAL URBAN WATER SECTOR REFORM PROJECT

REGULATORY HANDBOOK

Prepared by:

National Urban Water Sector Reform Project
Department of Water Supply & Quality Control
Federal Ministry of Agriculture & Water Resources
Plot 2789, Aguiyi Ironsi Street (Coop House)
Maitama, Abuja
Nigeria

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ABBREVIATIONS, ACRONYMS AND TERMS

FEPA	Federal Environmental Protection Agency
FMWR	Federal Ministry of Water Resources
MDG	Millennium Development Goals
MOU	Memorandum of understanding to implement WIMAG
NGO	Non-governmental Agency
NUWSRP	National Urban Water Sector Reform Programme
RBA	River Basin Authority
SWA	State Water Authority
SWRC	State Water Regulatory Commission (referred to in the Inception and Interim Reports as State Water Regulatory Authority (SWRA) but changed to 'Commission' in accordance with similar institutions in other sectors in Nigeria)
WHO	World Health Organisation
WIMAG	Water Investment Mobilisation and Application Guidelines
SEEDS	State Economic Empowerment Development Strategy
NEEDS	National Economic Empowerment Development Strategy

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1 INTRODUCTION

This handbook is produced by Water Management Consultants (WMC) as one of the outputs of the National Urban Water Sector Reform Project (TA-2 Consulting Service on National Guidelines for Regulating Water Supplies in Nigeria). It follows on from the assignment's Inception and Interim Reports in which the proposals for the regulatory framework were developed. The state governments and their regulatory agencies are advised to familiarise themselves with the content of these reports in order to understand the underlying logic and reasoning behind the recommended regulatory approach. In several cases statements from these reports are repeated in this handbook.

It is inappropriate for the detailed regulatory approach to be developed in advance of the establishment of the regulators. Rather, it is important to provide sufficient information for the regulators to get themselves established and started on their initial activities. This handbook does not prescribe particular methods or approaches but presents options together with their pros and cons to allow the regulators, once established, to make informed choices.

First and foremost it is important that the regulators familiarise themselves in detail with their legal obligations as set out in the law that establishes the regulator and other relevant legal instruments. This handbook does not, however, provide detailed guidance as to the application of the laws and other instruments as this is expected to be developed through longer-term technical assistance recommended to be provided to the state regulators (see below). The handbook provides guidance and assistance on a more generic and concept based approach.

It is anticipated that external consulting support will be provided to the regulators to assist in their establishment and early operations. Such support is expected to span several years. It is to be expected that during the process of development some of the recommendations / suggestions presented in this handbook may be amended or replaced altogether. In the longer term the state regulators will develop a more comprehensive guidelines / operations manual based upon a process of consultation and greater understanding of the needs within their particular jurisdictions.

This handbook is one component of the assignment's outputs. Other outputs include:

- Guidelines on regulating water supply and an action plan for implementation
- A revised WIMAG framework
- A model State Water Supply Services Regulatory Law
- Recommendations for amendments to existing legal instruments
- Terms of reference for a baseline survey and the establishment of performance targets
- Terms of reference for technical assistance and capacity building
- Action plan for implementation.

The state regulators are advised to familiarise themselves with these documents and to apply this handbook with due regard to them.

2 REGULATORY APPROACH

2.1 Legal obligations

First and foremost the regulator is bound by the laws and regulations that set out its remit, in this case the state Water Supply Services Regulatory Law. The law sets out specific rules, procedures and guidance for:

- The appointment of the commissioners and executive including remuneration and other employment conditions.
- Business of the Board.
- Consultation and public dissemination of information.
- Financing and financial management arrangements.
- Reviewing of performance of the WSPs.
- Delegation of powers where appropriate.
- Functions of the regulator.
- Licensing and enforcement of license conditions including removal of license.
- Approval of development plans.
- Tariff setting.
- Reporting with respect to WIMAG.

This regulatory handbook addresses only those areas that impact upon the functions of the regulator and how it is expected to operate. It focuses on the principal activities of performance monitoring and reporting (both for WIMAG and for its own regulatory obligations), economic regulation (tariffs) and the regulatory resources required.

2.2 Regulatory strategy

Regulatory strategy is a plan of action or policy controlled by a set of rules.

The principal characteristics of regulation are:

- Focus on outputs: leave inputs and management to the service providers, ensure services are provided, what customers want, what customers can and will pay for.
- Protection of consumers and customers from poor service and high prices by adequate representation, a duty of care and community involvement.
- Incentives to promote improved performance through reduced costs and a focus on priorities.
- Full cost recovery: definition, income requirements, capital maintenance, cost of capital.
- Encouraging real competition: contracting out, comparative competition, incentive price caps, private sector participation etc.

In formulating regulatory policy the regulator must ask several questions:

- What are we going to do (price, level of service, water quality etc.)?
- When are we going to do it (timetable for establishment, formulating detailed guidelines etc)?
- How are we going to do it (competition, price control, publication of reports on performance etc)?
- Who is going to do it (regulator's staff, consultants, other organisations etc)?
- Who else needs to be involved (other regulatory agencies (environmental etc) state and federal government, association of water regulators etc)?
- How will we know if we have succeeded (indicators)?

The development of the strategy follows once the regulatory policy is determined. Regulatory policy involves preparation of high level objectives for each chosen priority, detailed methodology, standards and/or targets, incentives, information and monitoring and regulatory action.

Until such time that the regulators are established it is inappropriate to prescribe a particular overall strategy as this is something for the regulators themselves to determine. This handbook presents several aspects that the regulator will need to consider in the development of its overall approach thereby facilitating informed choice and optimum approach recognising the individual characteristics in each state's water supply sector.

2.3 Objectives

The objectives of water supply regulators are not universally identical and although the states in Nigeria display many similarities subtle differences may impact on the regulatory objectives.

Notwithstanding such differences the primary objective of nearly all regulators is to continually improve customer value from what it would otherwise be. Such value can be measured in terms of price, level of service, service coverage etc.

It is not appropriate for this handbook to specify what the objectives of each regulator should be but possible objectives for consideration include:

- To ensure that water supply service providers operate in compliance with their licence conditions where appropriate.
- To insulate service providers from interference from political and other interest groups.
- To encourage / drive for greater efficiency from the water supply service providers.
- To protect customers from monopoly inefficiencies and poor service delivery.
- To encourage investment in service expansion and improved levels of service.
- To enforce statutory water quality obligations.
- To promote private sector participation in the sector.
- To ensure equitable levels of service delivery price.
- To ensure that water supply services are maintained at environmentally sustainable levels.
- To encourage service providers to be able to finance their own activities and thereby remove the need for state and federal subsidies.

A regulator may adopt some or all of these objectives. It is important to note that the above suggested objectives are not mutually exclusive and inter-dependencies exist, e.g. investment in service expansion and improved levels of service may also deliver greater efficiency.

The objectives of a regulator must sit comfortably with national and state policy on water supply and also conform to any statutory objectives set out in legislation and other legal instruments, notably the obligations of the WIMAG framework.

The regulator may establish several objectives but at the same time prioritise them, e.g. the promotion of investment in service expansion may be the highest priority in the first instance whereas private sector participation may be a lower priority. In the first instance the regulatory objectives should compliment the objectives specified in the WIMAG to avoid any potential conflicts. The different characteristics displayed in each state are reflected in the prioritisation of these objectives.

It is important that once the objectives and their relative priorities have been determined they are made public. The Office of Water Services (OFWAT), the regulator for the privatised water and wastewater industry in England/Wales sets out its objectives and methods in a publicly available statement (details available on www.ofwat.gov.uk). The state regulators shall be expected to publicise their objectives and priorities as one of their initial tasks.

2.4 Vision and mission statements

Based upon the determined objectives the regulator should set its broad goals in its vision and mission statements.

Table 2.1 below illustrates the vision and mission statements of several water supply regulators.

Table 2.1 Vision and mission statements

Regulator	Vision statement	Mission statement
PURC, Ghana	To become a model institution which ensures the delivery of the highest quality services to all consumers at fair prices.	PURC is committed to the development and delivery of the highest quality of utility services to all consumers and potential customers, while building a credible regulatory regime that will respond adequately to stakeholders' concerns and also ensure fairness, transparency, reliability and equity in the provision of utility services in the country.
WASA, Laos	A first class water supply infrastructure that delivers the highest service possible that represents best value to customers now and in the future.	To regulate in a way that provides a potable, sustainable and affordable water supply for all by 2020.
Nwasco, Zambia	Sound and sustainable water supply and sanitation services for all.	Regulate the services of the providers and the assets development in the water and the sanitation sector in urban areas focusing specifically on the: • Protection of the consumers • Enforcement of standards (efficiency, effectiveness, level of service, investments) • Promotion of market competition.
OFWAT, England and Wales	A water industry that delivers a world-class service, representing best value to customers now and in the future.	To regulate in a way that provides incentives and encourages the companies to achieve a world-class service in terms of quality and value for customers in England and Wales.

Although such mission and vision statements cannot guarantee good regulation they undoubtedly help to set the framework for good regulation and can give positive signals to the market and customers as to the regulator's intentions and approach.

A fundamental requirement at the outset for the development of state regulators is that they should formulate their vision and mission statements at the earliest opportunity. These statements should be brought to the attention of the general public at every available opportunity in order to gain the confidence of customers and other stakeholders. Although this is very much an issue for the regulators themselves to determine it is suggested that the examples presented above be used as a starting point.

2.5 Regulatory jurisdiction and activities

2.5.1 Regulatory jurisdiction

There is the potential for complex regulatory demands in the states with many different operators and institutional structures including but not limited to the state water supply agency (the principal water supply entity), WSPs, rural water supply operators and small scale vendors. It is unlikely that a state regulator will be in a position to regulate all these operators effectively and, despite the regulator's legal remit, practicalities will demand that actual regulation will be limited.

The principal determining factor in deciding what to regulate and what not to regulate is the resources available to the regulator. Recognising the limits on suitably qualified human resources in Nigeria it is recommended that the regulatory jurisdiction be confined, at least in the first instance, to the principal urban water supply agencies. All other supplies will effectively operate in an environment regulated by market forces (vendors) or community structures (rural schemes). As the capacity of the regulator improves the regulatory activities could expand to include the regulation of secondary service providers (vendors) within the supply area of the WSP, although based upon the lessons learned elsewhere in Africa this should be confined to quality rather than economic aspects.

It is not recommended that wastewater services be included in the regulator's remit at this early stage of the development of the regulatory framework.

2.5.2 Regulated activities

In accordance with best practice elsewhere in the world it is recommended that the current separation of water resource regulation (federal) and water supply regulation (state) is retained. For technical regulation of water supply the role of the regulator should be confined to compliance with water quality standards and level of service targets. Notwithstanding the separation of regulatory responsibilities between various agencies it is essential that the water supply services regulator works closely with other agencies, especially with respect to water resources and other environmental management.

Economic regulation should primarily focus on tariffs, discussed in more detail in Section 5 of this handbook. However, depending upon the objectives of the regulator, economic regulation can be expanded to include a degree of influence over capital investment decision making in this instance through MOU/WIMAG (Section 3).

2.6 Communications and customer interaction

2.6.1 Challenges and objectives

The water supply services regulator should develop an effective communications strategy at the outset designed to generate customer support for its activities and as a mechanism to drive for improved performance from the water supply providers. It is therefore essential that adequate resources are made available to the regulator for this activity including finance and appropriately qualified human resources (see Section 6 for details on resources).

There are two principal communications challenges for regulators:

- To mobilise support for the concept of regulation by the stakeholders, and
- To employ communications as a driver for improved operational performance.

Although seemingly two separate tasks they are so dependent upon each other as to be considered a single task.

The key elements in regulatory external relations are:

- Transparent regime to demonstrate accountability
- Open and constructive relationship with the media
- Targeted and close working relationship with all stakeholders
- Clear timetable
- Consultative approach
- Publishing information on comparative performance of water suppliers
- Customer representation.

In the event of sector restructuring, including private sector participation, it is the role of the regulator to convince customers and other stakeholders that the private sector could manage and deliver services more efficiently than publicly owned operations and is ultimately to the benefit of customers. It is important for the regulator to present itself as the customer's champion yet at the same time recognising the need for the service providers to be able to finance their activities.

2.6.2 Communications strategy

Transparency

The regulator should, at the earliest opportunity, develop a communications strategy, which should be based upon total transparency, i.e.

- Most communications with the water companies to be placed in the public domain.
- To set out through various forms of media the regulator's policies in certain areas and what is required of the service providers.
- To set out a clear timetable which allows all stakeholders to know what to expect and when.
- All major policy decisions, especially on issues relating to tariffs and willingness to pay to be subject to wide scale consultation.

Regular reporting

Based on best practice employed by regulators elsewhere in the world the regulator should establish an annual reporting system that:

- Reinforces the regulator's objectives, policies and methods.
- The achievements made in the last year and its plans for the coming year.
- Reports on service provider performance (see Sections 1 and 4 for further details).

The timing of the annual reports should be such that all state regulators employ the same reporting period to facilitate effective comparisons to be made[1].

Media

The regulator should employ the media to deliver its messages at every appropriate opportunity. These include press releases, radio and television announcements and interviews. Opportunities for the employment of the media include:

- Notification of published reports and the principal points therein
- Announcements with respect to policy
- Announcements of major regulatory decisions, e.g. tariff adjustments
- Notification of consultation proceedings.

Internet

Although wide-scale use of the Internet in Nigeria is not likely to be realised in the short term this should not stop the regulator from establishing a web-site. This could be facilitated through the proposed Association of State Water Supply Regulators dedicating a page to each regulator rather than each regulator establishing its own site.

[1] It is not anticipated that individual state regulators will be in a position to employ comparative competition, but this should be possible through the proposed Association of State Water Supply Regulators.

This site should include a complete library of information that the regulator places in the public domain including:

- All laws and regulations
- Mission / vision statements and regulatory approach
- Policy statements
- All reports and supporting data
- Tariff determinations and supporting data (subject to the protection of commercial confidentiality)
- All regulatory decisions
- Other information deemed to be of public interest.

Other communications activities

Other activities include the production of leaflets for general distribution informing customers of their rights and obligations.

Customer representation in the regulator's activities is important. Although the regulator needs to explain his policies such policies should reflect what customers want. There must be clear channels of communication that allow for consultation and feedback, essential for policy development, legitimacy and accountability and placing the regulator in a strong position in dealing with the utility companies and in pressing for service improvements.

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3 PERFORMANCE MONITORING AND REPORTING (MOU/WIMAG)

3.1 General

The new framework for capital investment in the water sector is based upon a contract (Memorandum of Understanding to apply the Water Investment Mobilisation and Application Guidelines-WIMAG). Each state shall enter into this contract with the federal government. The concept is that continued financial support from the federal government in the water sector shall be dependent upon the states improving their levels of service and operational performance in accordance with the targets set in the WIMAG. Failure to meet the targets may threaten future capital investment support.

One of the obligations in the WIMAG framework is the establishment of the state regulators, although there is nothing to prevent their establishment prior to the signing of the MOU.

Part of the agreement between the states and the federal government require regular monitoring of the performance of the water service providers as measured against their expected performance as set out in the agreement. The responsibility for monitoring is vested in the WIMAG Implementation Unit (WIU) which will contract out specific monitoring services to an independent consultant. Over time, the state regulators will be expected to provide increasing levels of support to the WIU in its monitoring activities. In the long term it is expected that once the federal government and the WIU has sufficient confidence in the independence and integrity of individual state regulators the monitoring by the WIU may be reduced to receipt and analysis of the regulators' reports.

These guidelines present the level of support required of the state regulators. It is recognised that the recommendations herein may be amended based upon terms of reference of the WIU and any recommendations for improvement the WIU (and others) may suggest.

3.2 Capital investment

3.2.1 Data collection activities of the regulator

The regulator will be expected to source and provide data for each investment as requested by the WIU in accordance with the WIMAG, as reproduced below:

No	Name	Description / remarks
1	Reference no.	Project reference number if applicable
2	Project title	Name of project
3	Project description	Outline description of project, e.g. rehabilitation of (insert town) distribution system. Can be broken down into subsidiary components, e.g. capital works, consulting services etc.
4	Current status	To describe project status, e.g. contract awarded, x% complete etc.
5	Estimated costs	State estimated costs of project (use contract amounts if awarded). Costs to be broken down into components, e.g. capital works and consulting services.
6	Sources of funds Subsidiary columns for sources including World Bank, FMWR, State Government, State Water Agency, other	To state the source of funds for the project on a percentage basis. If other specify source in next row.
7	Other sources of funds	State source of funds if 'other' is used in previous column
8	Funding confirmed	Yes or no.
9	Estimated start date	Estimated (actual if started) date of project start including design services.
10	Estimated completion date	Estimated completion date of project.
11	Investment category Subsidiary columns for: - Capital maintenance - Rehabilitation/refurbishment - Improved service - Service expansion	To state the nature of the investment on a percentage basis, e.g. a project to replace and expand distribution pipes could be split between capital maintenance (replacement of existing assets), improved service (to increase pressure) and expansion of the service to those not already served. *(Supplementary guidance on the definitions is to be provided)*
12	Achievement of objectives	A brief explanation as to how the investment is expected to contribute to the attainment of the objectives, e.g. a project to replace and expand distribution pipes could contribute to service expansion and reducing costs (by reducing leakage). Where possible the contributions to the objectives should be quantified, e.g. service expansion to increase customer based by x number of households, leakage reduction expected to reduce costs by y per year.
13	Remarks	Any other information considered necessary for inclusion.

3.2.2 Monitoring of procurement processes

Another role of the regulator is to ensure good governance by the service providers, in particular, adherence to procurement regulations and best practice.

It is not enough for procurement to comply with regulations but it must be seen to comply. In this regard the regulator may choose to develop a certification process for compliance (not necessarily applied to all procurement activities but limited to those over a specified value).

3.3 Operational management plan

3.3.1 Preparation and adoption

The operational management plan is to be prepared by the water service provider in consultation with the WIU within a specified time-frame after the signing of the MOU. This plan shall be reviewed by the WIU and, if accepted, is incorporated in the MOU/WIMAG framework. The operational management plan sets out the activities that the utility would be expected to undertake in order to contribute to the overall objectives. **This is not intended to be an obligation of the management of the utility to comply with such a plan but rather the basis upon which the WIU and/or its agents determines the performance improvement targets as set out in the WIMAG.**

Many of the operational activities will be dependent upon the capital investment plan and therefore appropriate cross referencing is required, e.g. leakage reduction activities may be dependent upon capital investment in network rehabilitation.

The operational plan will comprise many activities related to technical, financial and management issues, many of which are overlapping.

The role of the regulator shall be to provide assistance to the WIU in determining whether the plan is realistic and achievable yet still ensuring that the objectives and outputs represent real improvements.

3.3.2 Monitoring

Although the majority of the monitoring of performance will be based upon measurable indicators, the process will also include monitoring of operational activities to ensure that the water service providers are undertaking the activities as set out in their plans.

The regulator shall provide regular reports, possibly at quarterly intervals, to the WIU stating the observed activities of the water service provider and whether it is in compliance with its operational plan.

3.4 Measurement, evaluation and reporting

3.4.1 Baseline data

In accordance with best regulatory practice measurement and evaluation of performance should be based upon outputs rather than inputs. The WIMAG sets out a simple series of output based performance indicators that will constitute the MOU/WIMAG. They are based upon: service coverage, levels of service, water quality, cost efficiency, price equity, cost recovery, investment efficiency and environmental concerns.

Upon signing the MOU the WIU shall appoint a consultant to undertake a baseline review of operational performance in accordance with the schedules in the WIMAG. If the regulator has not been established at that time the consultant shall undertake this task independently. If, on the other hand, the regulator is established and operational it shall provide assistance to the consultant where requested.

3.4.2 Measurement

Prior to the establishment of the regulator the WIU will independently monitor the performance of the service providers. Once the regulator is established it will be expected to assist the WIU in collecting the data necessary to measure the actual performance against targets. The WIU shall reserve the right to independently check and, where appropriate, correct the data collected by the regulator.

3.4.3 Evaluation

With respect to the WIMAG the regulator shall not be required to undertake any material evaluation of the data. However, the regulator may be in a position to provide additional information to the evaluation process. The regulator shall be expected to provide support to the WIU in the evaluation process.

The data collected will be of use to the regulator in the evaluation of service provider performance as part of normal regulatory duties. The regulator may employ the evaluation made by the WIU for non-WIMAG reporting. It is recommended that the WIU and the state regulator co-ordinate and standardise their monitoring and evaluation regulatory activities accordingly.

3.4.4 Reporting

The state regulator's official line of communication is with the state government. All requests for assistance and responses to the consultant shall be through the state government. However, this should not exclude a line of communication between the state regulator and the WIU for day to day operational reasons.

4 REGULATORY PERFORMANCE MONITORING

4.1 General

A principal role of the state regulators is performance monitoring. The basic framework for performance monitoring is established in the WIMAG framework. For uniformity, ease of operations and to remove any potential for conflicting reports the WIMAG framework should be adopted as the basis for regulatory reporting. However, unlike the WIMAG framework which is primarily a measurement system for funding qualification the regulatory reporting can go further, especially with respect to expressing opinions on performance and comparing performance between water service providers (both with the state and those of other states).

The purpose of regulatory reporting is not just to measure performance against targets but to drive for improved services and efficiency. Although it is difficult to impose profit-driven incentives for improved performance on state-owned service providers, improved performance can be realised through the 'name and shame' approach, i.e. publicly highlighting any failings of the water service provider, most effectively achieved through comparative competition (see Section 4.8).

This section of the handbook provides guidance on the regulatory monitoring activities. It examines: water quality, levels of service, financial performance, corporate governance, and how to employ comparative competition to force change for the better.

4.2 Performance indicators (outside of WIMAG)

4.2.1 Selection

In the first instance the primary performance indicators shall be those employed for the WIMAG framework. However, the state regulator may identify additional indicators that reflect the needs of the customers and other stakeholders although such indicators will not feature in the WIMAG reporting, analysis and evaluation process. For example, a state regulator may wish to examine customer service performance on the basis of number and type of complaints and the time take to resolve them. However, it is advised that until such time that the regulator can confidently and accurately measure and evaluate performance based upon the WIMAG indicators the adoption of additional indicators should be resisted.

If additional indicators are considered appropriate they should cover factors related to product quality, product availability and customer service. In addition the measures should be selected on the basis of the following considerations:

- The services measured should be of real importance to customers and other stakeholders.
- The measures themselves should be meaningful to suppliers and to customers/stakeholders.
- Data collection and verification should be of high quality.
- Objectively assessed measures are preferred.

- The detail at which such measures should be targeted is important. This ranges from a large number of very specific measures to a relatively small number of aggregate measures. A balance is required between too many (which can confuse the target audience), too few (where the performance picture that is painted is too simple), and too aggregated (where the measures hide a range of individual performance from good to bad, under an aggregate heading of average). Preference is for a reasonably specific set of performance measures to give a good picture of performance in a range of dimensions, supported by a small number of aggregate measures to give a "condensed" view of supplier performance.

With all performance measurement there is a need to also balance the positive with the negative. Is it better to report 'failures' or 'successes'? Operating experience tells us that customers are generally not sensitive to the performance of their local water provider unless there is a service failure, or they have had some form of interaction with the company (e.g. a billing inquiry). In other words, customers measure the success of the water company not by how much time they have a water supply (for example), but by the time for which they do not have a water supply. Clearly, in any commentary, it would be reasonable to draw on the data to present the 'success' of the service provider, where appropriate. Such a 'success' may not necessarily relate to the level of service provision in any one year, but to the improvement made over a number of years.

It is important to note that any performance monitoring system will evolve over time. New measures will become necessary to reflect changes in the industry, customer expectation or social needs (e.g. staff welfare issues such as accidents and absenteeism may become of interest). When this does happen, experience is that new indicators can be developed through a period of consultation, followed by trials before finally being formally introduced into the performance measurement system. This allows any guidance notes to be properly developed before being implemented, allows the industry to become comfortable with the measures before going public and also (importantly) allows service providers the time to introduce robust monitoring systems in advance of formal reporting requirements.

4.2.2 Data quality

The use of poor quality data can undermine the confidence that can be placed in the system and can lead to incorrect decisions being made. It is in every party's interest to make all efforts to ensure that benchmark information is based on good quality data. This can be achieved in a number of complementary ways, as follows.

- Provision of guidance manuals on compilation of data.
- Testing and refining the definition and reporting of measures.
- Assessing the quality of the data provided
- Independent audit of the data provided by the water suppliers.

Water supplier managers and staff need to have guidance on what information to report within the performance monitoring framework. To this end, it will be necessary to provide detailed guidance notes on what is 'included' in a performance measure and what is 'excluded'. The preparation of such manuals forces the 'boundaries' of the measure to be clearly delineated, and allows users to report information in a consistent manner between companies, and over time.

In preparing the guidance notes for indicators, it is important to allow for testing any guidance notes, the compilation of data and the reporting of the measure. This can best be achieved by joint working between the regulator and the service providers. Proposed new measures can be tested using past data, on a sample trial basis, or on a full scale trial basis. It is likely that the measure will progress through all these stages before being publicly reported. The quality of the guidance notes, and experience gained in implementation, should be monitored. It is possible that further alterations to the measures will be required based on the results gained over a number of years.

It is unrealistic to assume that all data compiled will be of the highest quality, either in the short and (sometimes) in the long term. It is therefore important to understand the quality of the data and hence the confidence with which it can be used.

While the data might be compiled according to the requirements of the guidance notes the responsibility for compiling the data is generally vested in the service providers themselves. Given the anticipated public nature of the reporting system, it is important that some comfort is provided that the suppliers have followed the guidance notes consistently for which an audit by the regulator (or his agents) is required.

4.3 Service coverage

The WIMAG monitoring requirements and indicators for increased service coverage are considered sufficient for normal regulatory reporting requirements.

The role of the regulator beyond the WIMAG is generally related to identification of service expansion needs (location and type of service) and to advise the state government with respect to setting objectives for future service expansion.

In addition the regulator may elect to undertake a more comprehensive assessment of expansion needs including market research activities, e.g. to identify those areas that are willing to pay the tariffs that will come with an expanded service.

Service expansion will almost invariably result in increased unit costs (and hence increased tariffs) by virtue of the fact that the least cost resources are exploited initially and progressively becomes more expensive with expansion. The regulator will be required to evaluate the tariff implications of service expansion and advise the state government on the implications of any service expansion policy issues.

As part of the regulator's communications strategy the regulator will be required to present its findings to the public, highlighting tariff implications, results of market surveys and service provider performance with respect to its obligations and commitments in this regard.

Over and above the WIMAG reporting requirements the regulator should be free to express its opinion of the performance of the service provider with respect to service coverage, e.g. to state whether the performance was attributable to the failing of the WSP or for some other reason such as a failure to secure finance for investment.

4.4 Level of service

As with service coverage the WIMAG monitoring requirements and indicators for levels of service are also considered sufficient for normal regulatory reporting requirements. The principal indicators are: type of service (house connection, standpipes etc.) interruptions and hours of service, and customer complaints. In addition, water losses can also be considered within the scope of level of service even though it is categorised as an environmental issue within the WIMAG framework.

The role of the regulator is to analyse performance with respect to service delivery not only to determine performance levels against targets but to delve deeper into the reasons why performance may be under (or over) expectations and how this may impact upon future targets and monitoring.

The regulator should establish procedures for obtaining data, verifying, analysing and reporting on performance. Although the data will, in the main, be provided by the water service providers themselves it is unlikely that the regulator will have sufficient resources to ensure that the data provided is a true reflection of performance. This is a problem faced by many regulators elsewhere in the world but is relatively easily solved through the use of externally contracted regulatory reporters, professionals (normally consulting firms) appointed to undertake technical audits of the service providers. In some cases the reporters are paid for by the service providers but report to the regulator (in much the same way that a financial auditor will be paid by the company but report to the shareholders). Recognising the role of the WIU in the WIMAG framework the regulator is advised to guard against the appointment of a reporter (technical auditor) if much (or all) of the necessary data is collected through the WIMAG framework without first discussing the requirements with the WIU to guard against unnecessary duplication of effort.

A particular area of concern is that of water losses, a very emotive issue in water stressed environments. The WIMAG framework measures losses on the basis of losses per household (or connection) per day[2]. Although it is self-evident that reductions in leakage can and should be achieved the regulator should guard against setting specific targets for water loss reduction without first analysing the costs associated with the losses. The targets set in the WIMAG should be based upon reasonable assessments of what can and should be achieved with minimal costs, i.e. excluding massive investment in mains replacement and rehabilitation. Leakage reduction should be financially and economically viable. In practice leakage should be reduced to the level that the costs of any further reductions exceed the benefits. Leakage reduction at any price is not recommended. The direct operational cost savings of energy and chemicals are relatively easy to determine as is the potential to increase sales, but other less tangible benefits such as deferred capital investment require complex evaluation techniques. It is recommended that in the first instance the regulator should demand that leakage be reduced to its most economical level but leave it to the operator to determine what that level is. Once the regulator has a firmer understanding of what the economical level of leakage should be then this can be factored into the Tariff Policy (see Section 5.1) as a base reference for tariff determinations. Leakage reduction is then driven by financial incentives rather than subjective assessments.

Although the WIMAG employs the number of complaints received as an indicator the regulator can take this further by examining the nature of the complaints and taking of action where appropriate. In the first instance the regulator should be satisfied that the service providers have well functioning complaints handling facilities including a comprehensive complaints register. The nature of the complaints can be analysed and reported upon in the regulator's annual reports. In certain cases the analysis of complaints can identify simple but very effective improvements in operator performance. For example, an experience of the Water and Sanitation Authority in Lesotho revealed that most complaints were related to customers not being informed of planned supply disruptions. A simple process whereby customers were informed in advance of any supply interruptions reduced customer complaints by a considerable margin.

[2] The often misguided practice of using percentages of water production as a measure of losses is not recommended. Percentages are very misleading, as physical losses are more or less constant irrespective of demand. In peak demand periods demand rises and hence production must also rise but losses do not. The losses as a percentage of production will therefore fall giving an impression that things have improved whereas, in fact, nothing has happened. Target performance values based upon indicators such as litres per connection per day are more appropriate.

4.5 Water quality

From the customers' perspective water quality is possibly the single most important performance criterion. Consequently, the customer demands not only water that is potable but also the confidence that it will continue to be so[3].

It is outside the scope of this handbook to set out a detailed water quality regulatory strategy. However, on the basis that the service providers undertake to set their standards in accordance with the World Health Organisation (WHO) Guidelines for Drinking Water Quality (3rd Edition) it is appropriate for the regulator to establish the monitoring and regulatory framework suggested in those guidelines.

Best practice places the responsibility for water quality sampling, testing and analysis in the hands of the water service provider. The role of the regulator is that of an auditor to ensure that the process and reports reflect the true water quality performance of the service provider.

As part of the service provider's operational activities it would be expected to have established a monitoring plan to include[4]:

- Parameters to be monitored
- Sampling or assessment location and frequency
- Sampling or assessment methods and equipment
- Schedules for sampling or assessment
- Methods for quality assurance and validation of results
- Requirements for checking and interpreting results
- Responsibilities and necessary qualifications of staff
- Requirements for documentation and management of records, including how monitoring results will be recorded and stored
- Requirements for reporting and communication of results.

The role of the regulator is therefore to ensure that a service provider's water quality procedures are maintained in accordance with its monitoring plan. In addition a major regulatory responsibility not covered by the WIMAG approach is that of enforcing compliance and taking action in the event of health related incidents. The WHO Guidelines (Section 5.1.1 – Audit) sets out a framework for the audit approach and appropriate response and enforcement mechanisms:

> *In the audit approach to surveillance, assessment activities, including verification testing, are undertaken largely by the supplier, with third-party auditing to verify compliance. It is increasingly common that analytical services are procured from accredited external laboratories. Some authorities are also experimenting with the use of such arrangements for services such as sanitary inspection, sampling and audit reviews.*

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[3] It is important to recognise that any networked water supply system that is not continuously pressurised throughout the whole network will be exposed to contamination at those locations and during those periods when there is no pressure or water in the pipes. It is important that the monitoring regime includes sampling and testing throughout the network as well as the output from the water treatment works. Consequently, the drive to develop water supply infrastructure to a 24 hour supply throughout not only serves to improve service levels but also water quality.

[4] From WHO Guidelines (Section 4.4.5)

An audit approach requires the existence of a stable source of expertise and capacity within the surveillance agency in order to:

- *review and approve new WSPs;*
- *undertake or oversee auditing of the implementation of individual WSPs as a programmed routine activity; and*
- *respond to, investigate and provide advice on receipt of reports on significant incidents.*

Periodic audit of implementation of WSPs is required:

- *at intervals (the frequency of routine audits will be dependent on factors such as the size of the population served and the nature and quality of source water / treatment facilities);*
- *following substantial changes to the source, the distribution or storage system or treatment process; and*
- *following significant incidents.*

Periodic audit would normally include the following elements, in addition to review of the WSP:

- *examination of records to ensure that system management is being carried out as described in the WSP;*
- *ensuring that operational monitoring parameters are kept within operational limits and that compliance is being maintained;*
- *ensuring that verification programmes are operated by the water supplier (either through in-house expertise or through a third-party arrangement);*
- *assessment of supporting programmes and of strategies for improvement and updating of the WSP; and*
- *in some circumstances, sanitary inspection, which may cover the whole of the drinking-water system, including sources, transmission infrastructure, treatment plants, storage reservoirs and distribution systems.*

In response to reports of significant incidents, it is necessary to ensure that:

- *the event is investigated promptly and appropriately;*
- *the cause of the event is determined and corrected;*
- *the incident and corrective action are documented and reported to appropriate authorities; and*
- *the WSP is reassessed to avoid the occurrence of a similar situation.*

The implementation of an audit-based approach places responsibility on the drinking-water supplier to provide the surveillance agency with information regarding system performance against agreed indicators. In addition, a programme of announced and unannounced visits by auditors to drinking-water suppliers should be implemented to review documentation and records of operational practice in order to ensure that data submitted are reliable. Such an approach does not necessarily imply that water suppliers are likely to falsify records, but it does provide an important means of reassuring consumers that there is true independent verification of the activities of the water supplier. The surveillance agency will normally retain the authority to undertake some analysis of drinking-water quality to verify performance or enter into a third-party arrangement for such analysis.

It is recommended that the state regulators establish audit, response and enforcement procedures as set out in the WHO guidelines and ensures that sufficient financial and other resources are made available for this. This will include:

- Reviewing the service provider's plan to ensure compliance with statutory obligations and best practice.
- Ensuring that the service provider is fully compliant with its plan including the establishment of resources (material and human) necessary to implement the plan and that the procedures are adopted in accordance with the plan.
- Appropriate regulatory responses in the event of non-compliance with statutory standards and/or the plan.

4.6 Financial performance and regulatory accounting

4.6.1 Introduction

The WIMAG framework demands specific improvements in financial performance including areas such as revenue collection, turnover relative to operating costs, and depreciation recovery. However, although the use of such indicators drives for improved financial performance they are not, on their own, a complete representation of service provider performance. More detailed financial analyses of the service providers' accounts are necessary to determine the true status of the organisations. Furthermore, the tariff determination responsibilities of the regulator demands a much more rigorous financial analysis than that set out in the WIMAG framework.

The following subsections present an outline framework for regulatory accounting in the water sector. **It is important that all regulators adopt identical regulatory accounting structures to ensure consistency and effective financial comparisons. It is recommended that the proposed Association of State Water Supply Regulators be actively involved in the design and implementation of a regulatory accounting structure to be employed throughout Nigeria.**

4.6.2 Overview

The financial status of the water supply service industry in Nigeria is far from healthy. However, it has proved to be difficult to determine exactly how bad the situation is from an analysis of the statutory accounts that the state-owned individual water supply operators are required to produce. Inflation over many years has seriously eroded book asset values and depreciation provisions from their real costs. It is necessary to redress this position by the production of accounts that much better reflect the true state of the organisations, i.e. regulatory accounts developed using International Accounting Standards as a foundation that allow regulators, owners, investors, lenders and managers a much clearer picture of the financial position of each operator. Regulatory accounts will also facilitate tariff determinations that will ensure longer term financial sustainability.

It is important to recognise that the production of statutory accounts in accordance with government regulations is still required. The production of regulatory accounts is to be viewed as an additional activity required by regulators.

4.6.3 Objectives

Although the accounts for water operators are maintained in accordance with government accounting structures, regulatory accounts will require several amendments in order to effectively regulate the service provider. These include:

- The separation of the accounts of non-core (unregulated) and core (regulated) activities.
- The introduction of more detailed activity analysis within the core activities, necessary for comparative purposes, e.g. abstraction, treatment and storage; distribution; house connections; customer services; and overheads.
- The accounts may include a very high proportion of bad or doubtful debts that should be written off. Retention of these accounts on the balance sheets seriously distorts the real status of the enterprises.
- The accounts record assets as being valued at their historic (original purchase) cost and fail to capture the effects of inflation. In order to determine an appropriate return on capital it is necessary for the assets to be re-valued on a current cost basis at regular intervals.
- Similarly, depreciation is calculated on the basis of historic cost and is not sufficient to provide the funds necessary for capital maintenance.

The regulatory accounting system does not replace the government accounting system. Maintenance of the accounts in accordance with government regulations is required by law and necessary for the determination of tax liabilities.

It is recommended that the regulatory accounting system, developed by the regulator, strives to keep the deviations from the government accounting system to a minimum although, over time, the system may be modified to incorporate more detailed information as the regulatory process develops.

4.6.4 General requirements

The regulatory accounting requirements essential for fair and effective economic regulation of the water supply sector will require the following outputs for the core activities:

- Profit and loss statements
- Balance sheets
- Asset registers and depreciation schedules
- Cash flow statements
- Cost centre analyses.

All of these statements and reports will differ from the statutory reports in order to comply with the regulatory needs of the regulator.

4.6.5 Ring fencing of core activities

Principle

All income and expenditure, including capital investment, operational costs, overheads, cost of capital and non-cash expenditure items shall be separated between core (regulated) activities and non-core (unregulated) activities.

Definition

Core activities for the provision of water supply services are defined in Table 4.1.

Table 4.1 Definition of core activities

Activity	Includes	Excludes
Water abstraction	The abstraction of water for treatment and delivery into the piped water network.	The abstraction of water for other purposes such as irrigation.
Water treatment	The treatment of water prior to its delivery into the piped water network.	The treatment and bottling of bottled water for resale to the public.
Water storage	The storage of treated and untreated water prior to delivery to the piped water network.	The storage of water for bottling.
Water distribution	The distribution of water within the network.	The distribution of bottled water.
House connections / standpipe services	The installation of new and repair of existing house connections and public standpipes.	Domestic plumbing.
Customer services	Meter reading, billing and revenue collection; public awareness and advertising campaigns insofar as they relate to the piped water system, etc.	The advertising, distribution and sale of bottled water.
Overheads	Pro-rata the overhead activities associated with the above core-activities.	All other overhead activities.

Where resources are shared between core and non-core activities the costs should be split to reflect impact on the core activities, e.g. vehicles and equipment used for network operations and non-core activities.

Any activity that cannot easily be defined by the service provider as core or non-core should be referred to the regulator for definition.

Requirements

The service providers should restructure their accounting system into two principal categories: core (regulated) activities and non-core (unregulated) activities. To achieve this objective it may be necessary for the service providers to modify their charts of accounts.

To ensure transparency of operations it is suggested that each service provider open a separate bank account for the core activities. The opening balance shall reflect the cash balance of the core activities at that time. The statements from such bank accounts shall form the basis for cash flow analysis.

The sources of finance for the service provider generally comprise grants and loans from the government, although much of it may originate from development agencies channelled through the government. In most cases the investment is for core activities but in some cases finance is raised for non-core activities. Finance raised and the assets purchased for non-core activities should be excluded from the core activity regulatory balance sheets, including any accumulated profits (losses) attributable to these investments.

Table 4.2 defines the separation of finance between core and non-core activities.

Table 4.2 Ring-fenced sources of finance

Source of finance	Includes	Excludes
Loans	Loans received for investment in the core activities only. Short-term loans received to alleviate short-term core activity cash flow shortfalls.	Loans received for investment in non-core activities. Short-term loans received to alleviate short-term non-core activity cash flow shortfalls.
Grants and equity investment	Grants and equity funding received for investment in the core activities only. Equity Investment by private investors in core-activities.	Grants and equity funding received for investment in non-core activities.
Accumulated profits	Accumulated profits (losses) attributable to the core activities only.	Accumulated profits (losses) attributable to all non-core activities.

The service provider may generate income from various sources and it may not always be possible to determine how much is from core activities and how much is from non-core activities. It should be required that all income is clearly separated accordingly as indicated in Table 4.3.

Table 4.3 Ring-fenced sources of income

Source of income	Includes	Excludes
Water sales	Income from the metered and un-metered sales of water from the piped distribution system.	Income from the sale of bottled water. Income from the sale of water supply services other than the piped network, e.g. irrigation.
Connection fees	Income received for the installation of new and the repair/replacement of existing water supply connections to the network.	Income received for the provision of additional services to connected customers downstream of the meter, e.g. domestic leakage detection.
Contract services	Income received for undertaking works related to the core activities, e.g. re-routing a pipeline to accommodate road works etc.	Income received for undertaking works not related to the core-activities, e.g. construction of a pipeline for a private operator.
Disposal of assets	Income received for the sale of assets employed for the core activities.	Income received for the sale of assets employed for the non-core activities.
Equipment hire	None	Income received for the hire of the service provider's equipment to outside parties.
Interest receipts	Income from surplus funds invested in deposit accounts and issued bonds.	Income from interest payments from other enterprises indebted to the service provider.

All capital investment activities should be clearly separated between core and non-core activities as illustrated in Table 4.4. Where assets are shared, e.g. head office facilities, an appropriate proportion shall be allocated to the core activity asset base and the balance to the non-core asset base.

Table 4.4 Ring-fenced capital investment

Investment type	Includes	Excludes
Fixed assets	Investment in water supply infrastructure for the network supply system, e.g. abstraction, treatment, storage, pumping, distribution and support facilities.	Investment in non-core business activities, including water supply infrastructure not for the use of the network supply system, e.g. irrigation facilities.
Other assets	Financial investments, e.g. deposit accounts, from the proceeds of the core activities only.	Financial investments from the proceeds of con-core activities.

Operational costs should be clearly separated between core and non-core activities as illustrated in Table 4.5. Where costs are shared, e.g. management salaries, they should be apportioned appropriately between core and non-core activities. For instance, if a WSP director spends 80% of his time devoted to core activities and 20% to non-core activities then 80% of the salary charge shall be considered as a core expense. Similarly, other charges such as head office overhead costs should be apportioned in the same manner. It is accepted that a degree of management judgement is required in the separation of costs but the service provider should ensure that the separation of costs appropriately reflects the true situation as closely as possible.

Table 4.5 Ring-fencing of operational expenditure

Expenditure category	Includes	Excludes
Personnel	Salaries and other associated staff costs for those staff dedicated to the core activities. The relative proportion of salaries and associated staff costs for those staff employed on both core and non-core activities.	Salaries and other associated staff costs for those staff dedicated to the non-core activities. The relative proportion of salaries and associated staff costs for those staff employed on both core and non-core activities.
Power	Energy costs for core activities only.	Energy costs for non-core activities.
Chemicals and fuel	Costs of chemicals and fuel consumed for core activities only.	Costs of chemicals and fuel consumed for non-core activities.
Maintenance	Maintenance costs of assets dedicated to core activities only.	Maintenance costs of non-core assets.
Office and administration	The relative proportion of administration costs required by the core activities.	Administration costs for non-core activities.
Interest and finance charges	Interest and finance charges related to borrowing for core activities only.	Interest and finance charges related to borrowing for non-core activities only.

Depreciation is a special case and is dealt with separately.

In the early stages of the regulatory development process it is recommended that taxation should be excluded from the regulatory accounting process due to the many potential complications that may arise. However, it cannot be ignored totally as it does affect the cash flow status of the service providers. In this instance it is considered appropriate to apportion taxes paid (or due) between core and non-core activities on a simple basis relative to turnover or some other suitable parameter subject to the discretion of the directors of the service providers. The regulatory accounts shall specify the method of apportionment adopted.

4.6.6 Cost centre analysis

Principle

In many cases the service provider's accounting structures, at best, present financial details of the operation of its core activities as a whole. In order to identify inefficiencies to be addressed by the management of the service providers the regulator will need to undertake a more rigorous analysis based upon cost centres.

Cost centre analysis is central to the concept of regulation allowing the regulator to examine the performance of the service provider at every stage of the water supply process as opposed to the overall picture.

Definition

Cost centres are defined as identifiable operational units or activities within the core business. These can be based upon geo-political criteria, e.g. different towns within the area of supply, or operational criteria, e.g. treatment, distribution etc.

Requirements

Extensively detailed cost centre analysis is not necessary at the outset of the regulatory process although as a minimum it should be sufficient to break the costs down into the following five categories:

- Abstraction, treatment, storage and pumping
- Distribution
- House connections and standpipe services
- Meter reading, billing and revenue collection, and
- Overheads.

If the WSP is serving more than one town, and depending upon the tariff policy (if there are different tariffs for different towns) then these cost centres will need to be established on a town by town basis.

All cost items with the exception of interest charges should be allocated to a respective cost centre. This includes depreciation as determined on a current cost basis as described later on in this handbook. Interest charges should be a separate cost centre.

4.6.7 Debt management

Principle

Service providers in Nigeria, in general, suffer from poor payment performance from their customers. Although regulators should take the view that debt management is a responsibility of the management of the service providers, certain aspects of debt management will impact upon the regulatory process.

The nature of and scale of accounts receivable can be distorted by a reluctance to write off bad debts when there is no real prospect of collecting the revenue due. This can result in debts being maintained on the accounts indefinitely even if there no hope whatsoever of a significant proportion of them being repaid. The regulatory accounting system should establish a realistic provision for bad and doubtful debts to be written off.

Definition

Bad debts are those where the management of the service provider has reached the conclusion that no payment can be expected even with the employment of enforcement measures. Examples include businesses that have gone insolvent or customers who have left the area without settling their accounts and cannot be traced. Although subject to management discretion a guiding principle could be all debts that are more than 12 months overdue.

Doubtful debts are those where the management of the service provider has reached the conclusion that quite probably, but not for certain, that no payment can be expected even with the employment of enforcement measures. A guiding principle could be those debts between 6 and 12 months overdue.

In both cases the management of the service providers can employ their best judgement as to what are bad and doubtful debts.

Requirements

The regulatory accounts should, at the end of each fiscal year, be adjusted to record bad debts by converting them to operating costs in accordance with conventional accounting principles.

It is recognised that in the first year this amount could be relatively large as it may capture bad debts retained on the accounts for several years. In subsequent years the level of bad debts is expected to fall through improved debt management of the businesses.

4.6.8 Asset registers and asset valuation

Principle

The service providers are understood to record assets on their accounts based upon historical costs (original purchase prices) with no provisions for revaluing these assets to take account of inflation. The current process is understood to be in accordance with statutory accounting obligations and for taxation calculations. However, from a regulatory perspective, it is necessary to revalue these assets in order to determine a more appropriate regulatory capital value upon which a fair return on capital is calculated, and also to determine depreciation allowances that are sufficient to meet long term capital maintenance obligations. This does not require the replacement of the existing system but rather a separate calculation for the regulatory accounts.

In addition it is recognised that the service providers may retain assets on their accounts when those assets have been disposed of, no longer in use or have fallen into an irreparable state of disrepair. The regulatory accounts should call for these assets to be removed from the balance sheets.

Definitions

All assets should be re-valued to their modern equivalent asset (MEA) values. The MEA value is defined as:

$$\textbf{MEA value} = \frac{P \times f \times (L-Y)}{L}$$

Where:
P = Original asset purchase price
f = inflation multiplication factor (see example for definition)
Y = age of asset (years)
L = useful life of asset (years)

Inflation factor example
An asset was purchased in January 2004. Assuming 2004 and 2005 inflation rates were 17% and 14% p.a. respectively the inflation factor for that asset in Jan 2006 is:
f = (1 + 0.17) x (1 + 0.14) = 1.334.

Requirements

At the end of each fiscal year the service providers should produce a modified asset register with all core assets re-valued to their MEA values in accordance with the above formula. Such a modified asset register should exclude all assets that are no longer in use for whatever reason.

Any asset disposed of prior to the expiry of its useful life should have a written down value of zero and the balance of the asset value (on a current cost basis) should become a depreciation charge for the year it was disposed of. Any proceeds from the sale of the asset should be treated as income.

The re-valued assets shall then be carried forward to the regulatory balance sheets of the service providers.

4.6.9 Current cost depreciation

Principle

Statutory accounting regulations determine depreciation provisions on the basis of historic cost (original purchase price). Although this process is often a legal requirement for the determination of tax obligations it fails to reflect the true state of the service provider's finances. In particular, historic cost depreciation, if used as a basis for pricing (tariffs), will deliver cash reserves well below capital maintenance requirements (refer to following sub-section for definition), especially in a relatively high inflation environment as experienced by the Nigeria in recent years. Ideally, in a steady state condition the depreciation allowances (in the long-term) should equate to long term capital maintenance expenditure. This concept is know as 'Broad Equivalence'[5].

In accordance with standard commercial accounting practices depreciation must still be calculated on a historic cost basis for taxation calculations but an alternative mechanism, current cost accounting, is generally adopted for pricing purposes and reporting the state of the business to shareholders and lenders. Consequently, as with re-valuing assets to account for inflation, the depreciation allowances also have to be re-valued on a regular basis.

[5] Developed by OFWAT, the water and wastewater regulator for England and Wales.

Definitions

Capital maintenance is the replacement of assets at the end of their useful lives. With a large asset base and a steady state condition the annual depreciation charges, as measured on a current cost basis, should approximately equal the capital maintenance costs, thereby maintaining the overall value of the assets.

Although there is some evidence to suggest that the asset lives as defined in the statutory accounting regulations do not always reflect the actual asset lives it is not considered appropriate at this stage to provide an alternative approach for regulatory accounts. In future years, however, and in the light of improved data, the regulators may prescribe alternative asset lives for the regulatory accounts.

The current cost depreciation ($D_{current}$) of an asset is given by:

$$\mathbf{D_{current}} = \frac{\mathbf{P \times f}}{\mathbf{L}}$$

Where: P = Original asset purchase price (kip)
f = inflation multiplication factor
L = useful life of asset (years)

Requirements

At the end of each fiscal year the service provider should produce a modified depreciation schedule with all core assets depreciated in accordance with current cost accounting as set out in the above formula.

Depreciation should not be charged on assets that are no longer in use except for the remaining allowance in their final year of use. Depreciation charges should not be applied to any asset still in service if it has already exceeded its defined useful life.

The determined current cost depreciation charges are then carried forward to the annual profit and loss account.

4.6.10 Alternative depreciation mechanism for underground assets

Principal

Experience shows that the useful lives of underground assets (pipes, valves, etc.) are largely indeterminate; a particular pipe may last for up to 100 years whereas another may last for less than 10 years, both extremes far removed from conventional depreciation provisions of 30 to 60 years normally attributed to pipes and ancillary items.

Recognising that depreciation in a utility organisation is a mechanism for funding of capital maintenance (repair and replacement of assets) an alternative approach based upon capital maintenance requirements as opposed to depreciation is possible.

The principle, developed by OFWAT in the UK, is as follows:

1) No depreciation is charged on underground assets, but

2) All investment in capital maintenance of underground assets is treated as an operating cost.

Consequently, the value of the underground assets is maintained in perpetuity and the costs of capital maintenance are captured through treating them as operating costs.

The advantage of this system is that it is infinitely easier to estimate future capital maintenance demands than it is to determine useful asset lives. A further advantage is that any short-term fluctuations in capital maintenance cash flows are captured and can be accommodated in the tariff calculation. It is important that investment in new underground assets is not treated as an operational cost but rather the value of the assets are added to the asset base upon which the service provider can earn a return. Any subsequent capital maintenance on these new assets are then treated as operational costs.

Definitions

The definition of underground assets needs to be clarified, normally confined to pipes, valves and other ancillary products. Boreholes may require special attention as their lives are finite (especially the pumping apparatus) and may not qualify as an underground asset in terms of this alternative approach to capital maintenance.

It is important that the demands for capital maintenance of underground assets are properly planned and costs are accurately estimated.

Requirements

On a periodic basis the service providers should submit their capital maintenance programme for underground assets to the regulator for scrutiny and approval for inclusion in the tariff determination process.

The actual expenditure on capital maintenance for underground assets should be reflected as a cost in the regulatory profit and loss account and the value of the underground assets are maintained in perpetuity on the balance sheet.

New underground assets are treated as capital investment in the regulatory accounts but any future capital maintenance on those assets is to be treated as operational costs as for existing assets.

4.7 Corporate governance

The WIU will undertake a degree of monitoring governance with respect to the investment programme, notably compliance with procurement regulations and audit practices etc. The regulator has a more detailed responsibility to ensure:

- Compliance with legal obligations (procurement, accounting, etc.)
- Compliance with best practice
- Protection of investors and the promotion of investor confidence
- Promotion of private sector participation
- Promotion of improved efficiency
- Protection of customers.

Ultimately it is the responsibility of the service providers (their supervising boards and their management teams) to adhere to the principles of good corporate governance but it is the role of the regulator to ensure that this happens and to report or take action with respect to any incidents of failing to meet the requirements and/or expectations.

The regulator should be satisfied that the service provider complies with all its legal and procedural obligations including:

- The holding and reporting of general meetings (annual and extra-ordinary)
- Procurement procedures in compliance with regulations (both legally and as set out in subsidiary legal instruments such as donor procurement requirements specified in funding agreements etc.)
- Compliance with statutory financial reporting and audit procedures.

Furthermore, the regulator should be satisfied that the service provider, aside from its legal obligations, adheres to other, but equally important, good corporate governance practices including:

- Development and implementation of strategic plans
- Staff appointments based upon merit
- Transparency and accountability (including full disclosure and public dissemination of information)
- Proper customer consultation.
- Maintenance of the highest ethical standards.

4.8 Comparative competition

If it was possible for customers to choose between different suppliers efficiency would improve and prices would be driven down by market forces. However, water supply is generally provided on the basis of local monopolies where competition within the market is virtually non-existent. Consequently there is little or no incentive for service providers to become more efficient. It is a role of the regulator to create an environment whereby service providers behave as if they were operating in a competitive market. An effective tool for this is comparative competition whereby the performances of all service providers within the regulator's remit are compared and in some cases employed in the tariff determination process.

The most powerful aspect of comparative competition is the open publication of the performances of the service providers so that customers and other stakeholders can judge for themselves how their service provider is performing relative to others. The process is effectively ‘naming and shaming’ those that are under-performing and congratulating those that are doing well, and relies on the psychological incentive for management to improve.

The mechanism adopted by many regulators is to produce an annual sector performance report in an easy to read format employing diagrams that clearly illustrate relative performance. It is important, however, that comparative competition is fair and recognises any individual service provider characteristics that may explain apparent discrepancies in performance, e.g. larger service providers may have economy of scale advantages over smaller ones. There are techniques available to reduce the impact of such anomalies to ensure that comparisons are fairer but nonetheless a degree of regulatory discretion is required when it comes to evaluating performance and drawing conclusions.

In the Nigerian context individual state regulators will not be in a position to undertake comprehensive comparative competition as they will only be responsible for the water service providers within their respective states, very often limited to only one major service provider. An alternative mechanism is to make comparisons on a year-by-year basis, i.e. to compare the performance of the service provider today with past years on the expectation that efficiency should continuously improve.

The proposed Association of State Water Supply Regulators presents an ideal opportunity for national comparative competition bringing together performance data from all the state regulators and to compile an overall national water sector performance report. Based upon these outputs the individual state regulators can determine policy, prices and other actions to be taken with respect to the service providers within their regulatory jurisdiction. In the initial years the comparative performance reporting should be based upon the WIMAG performance indicators and the data collection activities of the WIU (assisted by the state regulators).

If there are several private sector service providers in a particular state, comparative competition can be employed to help set prices (when they are determined by the regulator as opposed to a contract bidding process). The performances of the better operators can be used as base parameters in the tariff determination process thereby applying commercial pressure on the service provider to improve performance to match that of the better service providers. Even in a state-owned environment comparative competition can still be used for price setting although the incentive for improvement is weaker.

Although each regulator in each state in Nigeria is only likely to be responsible for one major water service provider there is no reason why performance data cannot be shared between regulators. The proposed Association of State Water Supply Regulators will be a perfect facility for data collection, analysis and publication of comparative performance for all the regulated service providers.

5 ECONOMIC REGULATION (TARIFFS)

5.1 Tariff policy

5.1.1 Concept

The regulator should, at an early stage, set out its position with respect to tariffs through the adoption of a 'Tariff Policy'. Such a tariff policy should be founded upon the legal obligations and objectives as set out in the State Water Supply Services Regulatory Law. The Tariff policy effectively takes such details further and provides detail as to how they will be implemented in the state.

The tariff policy should be set by the regulator's supervising authority or commission with the executive arm of the regulator being responsible for its implementation. The role of the regulator in the development of the tariff policy is that of advising the supervising authority or commission.

The tariff policy development process should be inclusive although the regulator will be responsible for steering and guiding the participants and contributors. Ideally the tariff policy will be the result of a consensus of all stakeholders but in practice universal agreement will not be achieved on each and every issue. It is important for the regulator to take on board the views and opinions of the stakeholders but it is also important for a regulator to have the right to disagree in those areas where best practice and sound professional judgment is contrary to the wishes of any individual or group. Ultimately it is the regulator who will be responsible for implementing the tariff policy and, as such, should have the final say in its content.

5.1.2 Development process

The recommended process for the development of a tariff policy is that of preparation, consultation, draft publication, further consultation and final publication.

The preparation of the tariff policy will include an analysis of all the tariff policy options including advantages, disadvantages and regulatory implications. Appendix A of this handbook sets out many tariff policy options for consideration and can be used as a basis for the regulator's initial analyses. It is important to recognise that this handbook cannot recommend any particular tariff policy option but rather sets out many, but not all, of the options available allowing the regulator and other stakeholders to make an informed choice.

The first consultation process can comprise a workshop bringing together the various stakeholders including: water supply operators, secondary service providers (vendors etc.), NGOs, CBOs, investors (current and potential), policy makers, politicians, customer representation bodies (commercial and domestic) and others. Such a workshop should address each and every policy option with a view to determining the most appropriate for the state.

Based upon the results of this consultation process the regulator should be in a position to prepare a draft tariff policy. This draft tariff policy should then be redistributed to the stakeholders for their comments and, if necessary, further consultation.

Based upon the representations made with respect to the draft tariff policy the regulator should then prepare, approve and publish its final tariff policy.

Although a tariff policy should give stability to tariff determination methods and processes it should not be inflexible. As the environment changes over time so should the tariff policy. It is recommended that the regulator regularly reviews its tariff policy, say every five years, to ensure that the policy continually meets the requirements of the industry and its customers.

As a guide to the state regulators the tariff policy as produced by the Ghanaian Public Utilities Regulatory Commission is reproduced in Appendix B.

5.2 Tariff determination methods

5.2.1 Overview

There is no single 'one-size-fits-all' water supply tariff determination method. Each environment has its own unique characteristics that may demand particular treatment with respect to tariffs. Notwithstanding the potential for differences in the determination method the tariffs should be set with the objectives of efficient cost recovery (not necessarily immediately). Cost recovery, on the other hand should not be interpreted as giving operators the licence to pass on the costs of inefficiency to the customers but rather the role of the regulator is to ensure that only efficient costs are passed through (although allowing reasonable opportunity for the operator to achieve the efficiency expectations).

In most cases it is expected that the service providers are operating at below cost recovery levels. When factoring in corrections to the accounts such as current cost depreciation and poor revenue collection efficiency the situation is likely to be significantly worse than it would otherwise appear. It is generally unrealistic to suddenly increase tariffs to cost recovery levels in an instant. Rather a strategy that leads to cost recovery over a reasonable period should be developed. This 'phase-in' period to cost recovery should also be treated as the opportunity for the service providers to improve efficiency. This is illustrated in Figure 5.1 Transition to cost recovery

As the cost recovery tariff falls over time due to improved efficiency the actual applied tariff rises to meet it after a reasonable period. Once the cost recovery tariff is reached the applied tariff is thereafter expected to fall as further efficiency gains are realised (although this may not always be the case).

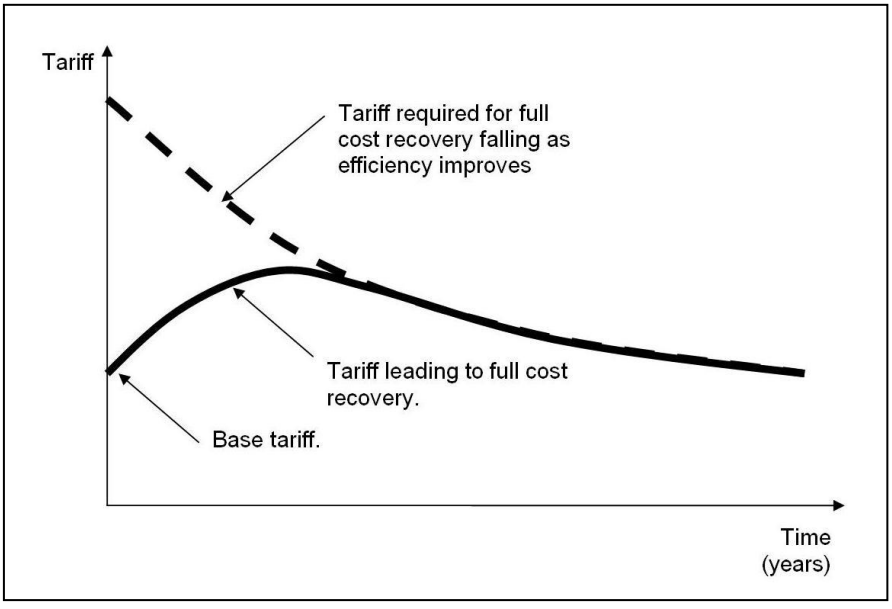

Figure 5.1 Transition to cost recovery

These guidelines present four approaches to the determination of tariffs: short-run accounting, short-run cash flow, long-run discounted cash flow and the unit cost approach. There are other methods available but they are all variations and/or combinations of one or more of these three methods. The selection of whichever method is a matter for the regulator to decide. However, as a rule, it is suggested that until the service providers are operating at cost recovery levels the unit cost or cash flow approaches are favoured. Thereafter, accounting or discounted cash flow may be more appropriate.

In the event of private sector participation the approach to tariffs may need to be different. The options available under such circumstances are also discussed.

5.2.2 Short-run accounting method

The short-run accounting method is the simplest method. The basic concept is to set tariffs on the basis of full cost recovery including return on capital and depreciation by dividing total costs by unit sales (m^3 for metered systems or number of households for un-metered systems). The total costs are based upon projections or budgets for the following year.

The principal areas of regulatory concern are the validity of the projections, especially as to whether the costs reflect realistic efficiency costs, and the allowable return on capital (profit and interest). Although interest payment projections can be readily determined from loan schedules the determination of what is a realistic 'profit' is always a matter of debate and challenge. The tariff policy should set out what return on capital (or profit margin) is considered appropriate.

It is important to ensure that depreciation and capital valuations (upon which a return can be earned) must be determined on the current cost accounting method (described in more detail in Section 4.6.9 above.

The accounting method can be adapted to accommodate subsidies by treating them as income in the analysis thereby reducing the cost recovery demands on the tariff.

The principal advantages of this method are its simplicity and accountability. However, it does have several disadvantages:

- It fails to capture the impacts of cash flow, especially new investment that is required to be undertaken during the year. If the required investment during the year is greater than the depreciation for that year the cash flow is likely to be negative unless such investment is financed by borrowing.
- Similarly, the converse is true. If there are no capital investment demands for the year the operator will generate excessive positive cash flows from depreciation.
- Irrespective of cash flow large new investments will result in sudden price shocks due to the large increase in depreciation charges that would ensue.
- If is difficult (but not impossible) to apply this method as a transition towards cost recovery.

5.2.3 Short-run cash flow method

This is very similar to the accounting method but excludes non-financial costs such as depreciation but replaces this with actual cash flows for investment and debt service. The principal advantage of this method is that it ensures positive cash flows for the service provider.

On the other hand, the disadvantage is that it may result in wildly fluctuating tariffs as cash flow fluctuates although this can be alleviated through short-term borrowing.

5.2.4 Long-run discounted cash flow methods

Long-run average tariff

Discounted cash flow methods are based upon the principle of time value of money. It is outside the scope of this handbook to describe the concepts and methods in detail. There are many texts on discounted cash flow and it is recommended that the financial regulatory staff familiarise themselves with the details. This handbook provides a summary overview of the concept.

The basis of the discounted cash flow is the Net Present Value (NPV) calculation, i.e. to discount all income and costs to their present day value through the application of a discount rate that reflects the cost to the business of capital. If the NPV is negative then the business is not covering its cost of capital whereas if it is positive the business is earning more than its cost of capital. For the optimum tariff the NPV should be zero.

This method is applied to determine uniform tariffs over a long period (between 5 and 20 years). In this calculation all actual costs are included in the model (generally an MS Excel spreadsheet). This includes capital and operating costs but excludes depreciation and interest charges. In addition, the MEA value of the existing assets should be included in the model as an initial cost for the first year of the model and any written down values at the end year treated as a credit[6].

The basic formula for the determination of the tariff:

$$\text{Tariff} = \frac{\text{discounted costs}}{\text{discounted sales}}$$[7]

It is important to ensure that the existing assets are adjusted to reflect MEA values. It is not necessary to estimate inflation for the determination of the tariff and current day costs are simply projected, unadjusted for inflation.

The net result is a uniform average tariff that is assumed to increase with inflation. The advantage of this method is that the tariff is uniform and the only adjustments required thereafter are for inflation. However, there are many disadvantages with this method:

- Data for long-run analyses are not always available and/or are very speculative.
- The result is often a tariff that is below cost recovery in the early years but compensated by being above cost recovery in the longer term. Although it is easy to justify a progression towards cost recovery it is difficult to justify excessive profits in later years, even if those profits are necessary to recover past losses.
- The derived tariff is unresponsive to cash flow demands and the service provider may be starved of cash resources, especially in the early years when cash is desperately required for investment in improved services.
- The model assumes all costs and revenues will rise with inflation whereas this may not always be true, especially when improved operator efficiency is to be expected.

[6] The concept of treating the existing assets as an initial cost and crediting written down values is often difficult to grasp. It is more easily understood if the model was looked on as a business where the existing values reflect an investor's original purchase of the business and the written down values at the end is the resale value.

[7] The concept of discounting sales is explained mathematically in Appendix C of this handbook.

- Debt service and taxation costs do not always increase with inflation. Although debt service is not included in the model it does affect cash flow. Taxation, on the other hand, is normally based upon depreciation provisions being calculated on a historic cost basis whereas the discounted cash flow model assumes current cost accounting. Taxation, therefore, is generally under-estimated in such models, although the differences are often small and of limited consequence.

Long-run marginal tariff

This is similar to the long-run average tariff except that it only examines costs for increased service coverage and the denominator is the additional sales. There is a long-standing debate in economic circles as to whether marginal or average tariffs are more appropriate.

Generally, the nature of the water supply industry is such that unit costs of supply increase as systems expand, e.g. cheaper water resources are exploited first, wider coverage drives up distribution costs etc. Consequently, the marginal tariff is, in general, higher than the average tariff[8]. The principal economic argument for the use of the marginal calculation is that it returns the true economic value of water and is effective in demand management whereas the average tariff calculation returns a tariff that does not reflect the costs of service expansion.

It is recommended that the regulator does not employ the marginal cost method until such time that tariffs are at cost recovery levels.

5.2.5 Unit cost approach

It is expected that the service providers and the regulator will have insufficient data to undertake a detailed tariff analysis based upon long-term discounted cash flow analysis. Although such data are to be collected as part of the regulatory reporting process, their totality, reliability and accuracy are likely to be questionable.

An alternative approach based upon unit cost analysis can be employed. Essentially, this approach negates the need for detailed sales and costs profiles but rather analyses the actual costs per unit of water sold. In determining future unit costs assumptions are made concerning efficiency improvement expectations based upon comparative analysis and professional judgement. A principal feature of this is the short-run nature, i.e. three to five years, thereby negating the need to undertake comprehensive analyses of long term investment plans.

It is recognised that this approach is not accurate but this is not a serious issue whilst the service providers are operating at less than full cost recovery (especially with respect to depreciation). Any inaccuracies will result in variability in the gap between existing tariffs and the required full cost recovery tariff. Accuracy only becomes a major concern once full cost recovery is achieved and the regulator's role shifts towards the protection of the customer against excessive profiteering.

The unit cost approach has other advantages, the most notable of which are that it lends itself to comparative competition and it is easily monitored.

Unit costs - definitions

The unit costs of water supply can be broken down into three elements:

- Basic operating costs (excluding depreciation and return on capital)
- Depreciation

[8] This is not always the case as the average tariff may include significant inefficient costs whereas the marginal tariff may be based upon efficient costs only.

- Return on capital (profit and interest).

The basic operating costs can be subdivided into energy and non-energy costs recognising that unit energy cost is unique to each service provider and cannot be compared on a like for like basis.

Simple reporting processes can identify the three basic cost elements described above together with data related to sales and revenue collection. The tariff determination process examines the data to estimate realistic unit cost allowances recognising the potential for efficiency improvements, depreciation and capital maintenance demands, and the individual characteristics of each service provider.

The actual unit costs can then be monitored and compared with the allowances determined in a tariff review. In subsequent reviews the unit costs can be recalculated based upon actual costs in the preceding review period.

Demand and sales

Although a more rigorous tariff analysis would analyse, in detail, projected demands and sales it is felt that a less rigorous approach is justified in this instance because:

- It is expected that sales will increase over time allowing for several unit costs to fall, e.g. non-energy costs. However, until such time that full cost recovery is reached the gains realised from this can serve to promote the move towards full cost recovery.

- The increase in sales in the review period is not expected to be so large as to warrant a detailed demand analysis. However, a small reduction in non-energy unit costs could be provided for.

If, however, in the opinion of the regulator the increase in sales is estimated to be sufficiently large as to warrant special consideration the regulator can choose to examine the implications in more detail.

Operating costs

Energy and chemicals. The unit cost of energy and chemicals (relative to water production) should be considered to be static in real terms unless there is evidence to suggest otherwise. It is assumed that these costs are directly proportional to water production.

However, expectations of improved leakage control (reducing production but not sales) will reduce the unit costs (relative to sales). The regulator should undertake a simple assessment of leakage reduction expectations for incorporation in the unit cost analysis

Non-energy/chemical costs. Other costs, e.g. labour etc. are expected to fall over time for two principal reasons:

- Improved efficiency, and
- Increased sales over which these costs are spread.

The regulator can take a view as to the potential for these costs to be reduced employing comparisons with the other service providers (including those from other states).

Capital costs

Unit capital costs are reflected in the tariff as depreciation. This should be calculated on a current cost basis to reflect the true value of the capital employed (Section 4.6.9). Although technically incorrect, it is assumed for the tariff determination process that the unit depreciation charge is constant over the review period (in reality it is expected to fall as sales increase and greater use of the asset is made).

Full cost recovery of this item is not necessarily expected in the review period. Depreciation is, in effect, the cost element that is expected to rise over time to attain full cost recovery.

Capital structure and the cost of capital

In accordance with conventional economic theory capital structure should have no bearing on the performance of a business. This only applies when full cost recovery is attainable. Without full cost recovery, including depreciation, the minimum requirements for return on capital should equate to debt service; return on debt (interest) and return on equity (repayment of principal). For simplicity, the unit cost of return on capital shall be the total requirements divided by sales at the start of the review period.

Taxation

Taxation on profits is to be estimated by the regulator and added as a cost to the unit costs. In the early years it is anticipated that the service providers are unlikely to generate taxable profits and tax is therefore not considered to be a major issue.

Inflation expectations

The basic tariff determination calculation is ‘real’, i.e. ignoring inflation on the assumption that costs and tariffs shall rise with inflation.

Revenue collection efficiency

The tariffs shall not be determined on the basis of poor revenue collection. It is expected that the NPSEs shall undertake significant improvements in their revenue collection performance although a small allowance for an acceptable level of non-payment shall be provided for in the analysis. The analysis shall not consider non-payment by government agencies as acceptable and should therefore not be considered in the determination process.

Method

The method employed is to take each cost element and divide it by the volume of water that is sold and paid for. It is to be expected that this unit cost shall fall over time due to costs falling and ‘paid for’ water increasing.

This is best illustrated with the example shown in Figure 5.2.

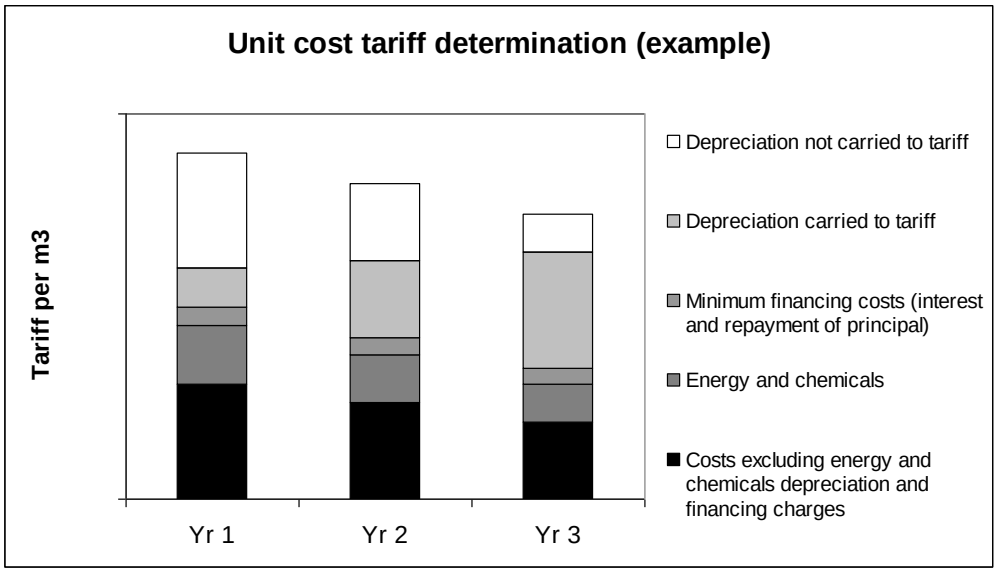

Figure 5.2 Unit cost tariff determination (example)

The above example illustrates that although unit costs fall over time the tariff increases leading towards cost recovery by gradually increasing the amount of depreciation passed through to the tariff. In the above example only some 25% of depreciation is recovered in year 1 but by year 3 this increases to some 75%.

There are many advantages of this system including:

- Limited data requirements and no need for long-run analyses
- Can ensure positive cash flows to the service provider
- Simplicity and easily disseminated to the general public
- Easy to monitor performance against expectations.
- Promotes improved efficiency.

It is suggested that in the early years of regulation in the states the regulators employ this simplified tariff determination process until such time that cost recovery has been achieved and the capacity of the regulator has reached a level that can enable more complex determinations.

5.2.6 Tariffs and private sector participation

The introduction of private sector participation into the water supply sector will present additional challenges to the regulator with respect to tariffs. There are several approaches to tariff determinations for the private sector depending upon the nature of the private sector participation management model.

It is anticipated that the only realistic private sector participation option in the short term is the management contract model for which there is very little regulatory input over and above the non-private sector participation model. However, these guidelines present an overview of regulatory concerns for lease and concession models should they, at some stage in the future, become viable.

Management contracts

The management contract can be viewed as an enhanced outsourcing activity. Under such arrangements the role of the regulator will largely be unchanged, i.e. regulating the water service provider that has engaged the management contractor. The only difference with respect to tariff determinations is that the management fees will need to be added to the cost profile but this should be more than compensated by the improved performance that a management contractor will deliver.

The unit cost approach can still be applied in these circumstances although for consistency the targets / expectations of the regulator should be similar to those set out in the management contract. Similarly, the tariff review period and the management contract periods should be identical.

Longer-run tariff models may not be appropriate due to the short duration of most management contracts.

Leases

Lease contracts can be based upon tariff bidding, i.e. the bidder offering the lowest tariff will be awarded the contract. Consequently, the tariff determination process is simplified and comprises two principal cost elements:

- The contractor's tariff (excluding the lease fee), and
- The lease fee.

The profit incentives inherent in a lease contract should ensure that base operating costs are maintained at efficient levels and regulatory intervention is expected to be minimal. Provided the regulator is satisfied that the bidding process is fair and competitive his primary concern will be the determination of an appropriate lease fee.

Ideally, the lease fee should be sufficient to recover depreciation, return on capital and other sundry overhead costs not borne by the leaseholder. The regulator must be satisfied that the lease fee charged is appropriate and covers efficient costs. Due to the capital intensive nature of the water supply industry the lease fee may be expected to account for 30 – 50% of the tariff.

Under these circumstances it is still possible to employ a unit cost approach with the lease fee set to increase over time to reflect an increasing level of capital cost recovery.

Leases are normally medium duration (5 to 10 years) and as such will span more than one tariff review. It is therefore necessary to provide for a tariff adjustment in the lease contract that allows periodic tariff reviews by the regulator.

Concessions

The concession model whereby the bidding process sets the tariff should provide a base tariff for subsequent reviews. The role of the regulator is to ensure that the tariffs are set at levels that ensure cost recovery and provides the investor with a fair return on capital but protects the customer from excessive profiteering.

The primary regulatory responsibilities will be to review tariffs regularly, i.e. every five years but allowing for interim inflation related adjustments. A principal concern is that of monitoring capital investment to ensure that the tariffs reflect the level of investment and that the investments are actually being carried out.

A major problem with concession contracts and tariffs is that the contractor will require recovery of his investments over the contract period, e.g. 20 years, when the life of the asset for depreciation purposes may be significantly longer. The accounting approach is to charge 'contract depreciation' which will be higher than 'useful life depreciation' with adverse tariff implications. The concession contract can protect against this through an undertaking for the assets to be repurchased at their real written down values at the end of the concession period.

5.3 Tariff determination process

5.3.1 Major tariff review

The tariff determination process should be set out (in broad terms) in the Water Supply Services Regulatory Law. The precise details of the tariff determination process should be set by the regulator and either included in its tariff policy or through a separate instrument. It is not possible to set out a detailed process as this will be up to the regulator to determine. However, as a guide the process should include the steps listed in Table 5.1.

Table 5.1 The tariff determination process

Activity	Duration	Responsible
Preparation of Tariff Policy including consultation, draft and final policy documents.	3 – 6 months.	Regulator (including commission).
Preparation of draft tariff determination methodology statement and distribution for consultation.	3 – 6 months after approval of Tariff Policy.	Regulator.
Representations from water service providers and other stakeholders.	Up to 1 month after draft methodology .	Water service providers and other stakeholders.
Preparation of final tariff determination methodology.	Up to 1 month after representations.	Regulator.
Preparation of regulatory reporting requirements for tariff determinations.	Up to 3 months after methodology statement.	Regulator.
Data collection for and regulatory submissions.	Up to 3 months after reporting requirements issued.	Water service providers and other stakeholders but audited by regulator.
Preparation of draft determinations and distribution for consultations.	Up to 3 months after submissions received.	Regulator.
Representations from water service providers and other stakeholders.	Up to 1 month after draft determinations.	Water service providers and other stakeholders.
Final determinations and approval.	Up to 1 month after representations.	Regulator.
Adoption of new tariffs.	Up to 1 month after approval.	Water service providers.

In addition to the steps outlined in Table 5.1 the regulator should be very active in ensuring that the general public is informed of the process and outcomes at every opportunity.

5.3.2 Normal interim adjustments

Although major tariff reviews follow an extended process the interim adjustments, primarily for inflation and other similar factors, should be automatic. The process is then simply a periodic publication of the adjusted tariffs and adoption by the service providers.

5.3.3 Exceptional interim adjustments

Aside from normal interim adjustments there may be a material change in circumstances that was not anticipated in the original determinations. In such cases the regulator may be required to initiate an interim tariff review, the details and process to be decided if and when such a situation arises.

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6 RESOURCES

6.1 Introduction

The effectiveness of a regulator depends upon adequate financial and human resources. There is no standard formula for determining the size and capacity of the regulator's staff. In theory, the size of a regulatory organisation, and therefore the cost of regulation, should be such that the costs of any further expansion will not be recovered by improved value to customers. In practice, such a 'break-even' point is hard to determine and size is determined often by subjective assessments as to what is required and the resources necessary to meet such requirements.

This handbook presents an outline framework based upon the scope and scale of activities the state regulators in Nigeria will be anticipated to perform. This scope and scale will vary from state to state and as such the resources suggested herein are for guidance only.

The most important resource for a regulator is its staff. However, without the necessary financial resources to pay them competitive salaries and to cover the costs of other necessary services the regulator is impotent.

6.2 Human resources

6.2.1 Needs

In common with most other water supply regulatory agencies in the world the state regulators will be expected to employ staff with skills and experience in: law, engineering, finance/economics and communications.

The required size and structure of the state regulators can be estimated based upon:

- The size of the regulated service areas in each state, predominantly the major urban centres
- The limited number of regulated entities, generally the SWAs.
- The scope of regulation, tariffs and levels of service monitoring.
- Limitations on funding (initially expected to be through government subvention).

It would be expected that a professional staff of no more than eight persons for each regulator would be necessary plus support staff, secretaries, drivers etc. It is anticipated that at least two persons will be required for the engineering and finance/economics departments and one each for law and communications.

In some of the smaller states the size could be reduced to a minimum of two professionals, e.g. an accountant/economist and an engineer, provided their skills bases could adequately cover the four primary areas. It will not always be necessary for a regulator to employ a full-time lawyer but it would be expected that the professional staff employed by the regulator should have a reasonable understanding of the legal aspects of the regulator's obligations, especially with respect to activities such as tariff determinations, enforcement notices and dispute resolution. Under these circumstances it is suggested that adequate financial resources are set aside for calling upon the services of legal professionals on an as and when needed basis.

Appendix D sets out suggested job descriptions for the four professions, but, as stated above, this need not imply that all four positions need to be filled in every case.

In order to ensure a high degree of skills and integrity it is often necessary to reward the staff at higher rates than those provided by government salary structures. It is recognised that whilst the regulator is financed by government subvention it may be difficult to offer salaries outside the government scales. However, if and when the regulator is financed through surcharges on the tariff and greater independence is realised higher salaries should be considered.

6.2.2 Training and development

Undoubtedly, the staff to the regulators will require training in order to perform their functions effectively. Until such time that the staff are employed it is not possible to establish a detailed training needs assessment and training programme. However, it is anticipated that training will be needed in the following areas:

Legal

- Institutional structures and legal basis: existing legal instruments defining role of the regulator, the legal status of regulated service providers, the legal status of other institutions and consumer rights and obligations.
- Legal processes: enforcement, appeals and dispute resolution.
- Advisory activities: advice to government, preparation of any additional legal instruments, consultation processes.

Technical

- Investment appraisal: level of service assessment, demand planning, investment analysis.
- Level of service and performance monitoring: Establishment of monitoring procedures, audit procedures and analysis.
- Comparative analysis and reporting: identification of comparative indicators, target setting and reporting.
- Compliance and enforcement: compliance reporting, enforcement notices, actions, legal redress.

Financial and Economic

- Basic accounting concepts and financial reports: accountancy basics, financial reports, financial ratios.
- Advanced financial accounting concepts: current cost accounting, capital maintenance, taxation, return on capital.
- Regulatory accounting: design, reporting requirements and monitoring.

- Economic regulation and financial analysis: economic analysis, financial analysis concepts, tariff policy, tariff determination methods and guidelines.

Communications

- Corporate image: Self perception and public perception.
- Media skills and reporting: media skills, reporting and publication.

The training and development of the state regulators' staff should comprise a mixture of formal in-house training, on-the-job training and courses designed specifically for regulators. The first two of these may be provided by international consultants and the latter may provided by specialist institutions around the world.

6.3 Other requirements

6.3.1 Operational facilities

The operational facilities of a regulator are relatively simple to determine. The basic requirements include:

- Sufficient office space
- Computers including commercial office software
- Media facilities, e.g. projector and screen.
- Telephones and internet services
- Consumables (stationery etc.)
- Vehicle(s)
- Hiring of venues for workshops and other consultation activities.
- Other sundry equipment and facilities.

It is important from the perspective of maintaining the independence of the regulator that it is not seen or perceived to be an arm of the state government. It is therefore preferred that the office of the regulator be located separately from other government offices.

As a champion of the customer the regulator must be easily accessible by the general public. This requires that the office of the regulator is located in a relatively central location. In some states the regulatory responsibilities extend to more than one major urban centre and consideration should therefore be given to the establishment of branch offices where appropriate.

Aside from being physically located for ease of public access the regulator should be easily contactable by telephone, post and e-mail. It is important that the regulator's office has sufficient office infrastructure, e.g. more than one telephone line. Ideally, the regulator should establish a free-phone system, therefore not burdening the customers with the cost of telephone contact.

6.3.2 External services

Other services that a regulator will need include:

- Communications services:
  - Establishment and maintenance of a web site
  - Printing and publication services for reports
  - Media space (newspaper, local radio and television).
- The appointment of specialist services as and when required:
  - Engineering consultants for independent technical audits
  - Independent water testing for verification of the service providers reports
  - Accountants for independent financial audits
  - Marketing consultants for specialist customer surveys etc.
  - IT services for establishment and maintenance of the web site.
- Training and development of the regulator's staff where required.

These services should not be underestimated. It is unlikely that the regulator's staff can perform all the required tasks without employing some or all of the above. It is therefore important that sufficient budgetary allocations are made to finance these services.

6.3.3 Projects

Regulation is an ongoing and evolving process and it is necessary for the regulator to be fully aware of the developments within the water supply sector and the social environment that may impact upon the regulatory approach. This will require a regulator to initiate many projects and studies from time to time either independently or as part of a wider strategy through the proposed Association of State Water Supply Regulators. Specific projects may include:

- Contingent valuation studies (willingness to pay etc.)
- Extensive demand analyses, e.g. determination of price and income elasticities of demand
- Poverty assessments and the development of a social strategy
- Studies into specific initiatives, e.g. the development of water kiosks
- Studies into the role of secondary service providers, e.g. water vendors.

It is anticipated that in the early years of regulation such projects are likely to be undertaken with the financial and logistical support of multilateral and bilateral donors although in the longer term the regulators themselves may be required to undertake such projects without any external financial assistance.

6.4 Financial

6.4.1 Requirements

Appendix E of this handbook sets out a format for determining the financial needs of the regulator broken down into six categories:

- Salaries and on-costs
- Office facilities
- External services
- Specialist services
- Projects
- Contingencies.

6.4.2 Sources of finance

A key consideration in the establishment of a regulatory framework is how the regulator is to be financed.

The principal characteristics of funding should be:

- Independence - free from being used as an influencing factor by political or commercial interests
- Adequacy – sufficient to meet the needs of the regulator to perform its functions effectively
- Assuredness and regularity – funds assured to facilitate planning and regular enough to meet cash flow demands.

General funding for regulators can come from three principal sources:

- Government subvention
- Donor support, e.g. capacity building and projects
- Contributions from the regulated utilities, e.g. surcharge to the tariff.

Government subvention and, to a limited degree, donor support, do not protect the independence of the regulator[9]. The best practice approach adopted by most successful regulatory frameworks is that the water industry itself finances the regulator, either through a surcharge to the tariff, licence fees or some other appropriate formula.

However, it is recognised that it may not be possible to develop an industry financed arrangement in the first instance and government subvention, with support from donors, will be necessary in the early years. It is therefore suggested that the funding be a staged transition process from government subvention to an industry financed structure over a prescribed period, say five years.

As part of the regulator's obligations to be transparent and accountable it is essential that the regulator's accounts are made public and subject to independent audit.

[9] In Laos the Asian Development Bank provided support to WASA, the regulator, but on occasion tried to use this support as a lever to steer regulatory policy and approach in a direction that the regulator felt was inappropriate, notably with respect to certain tariff policy directives. Fortunately, WASA was able to resist this pressure and maintained its independence and integrity.

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