

# GUIDELINES FOR CONDUCTING A FINANCIAL MANAGEMENT ASSESSMENT OF WATER AUTHORITIES

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# GUIDELINES FOR CONDUCTING A FINANCIAL MANAGEMENT ASSESSMENT OF WATER AUTHORITIES

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by

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## RELATED WASH DOCUMENTS

*Assessment of the Operations and Maintenance Component of Water Supply Projects.* Technical Report No. 35. June 1986.

*Willingness to Pay for Water in Rural Areas: Methodological Approaches and an Application in Haiti.* Field Report No. 213. September 1987.

*Guidelines for Conducting Willingness-to-Pay Studies for Improved Water Services in Developing Countries.* Field Report No. 306. October 1988.

*Guidelines for Institutional Assessment: Water and Wastewater Institutions.* Technical Report No. 37. February 1988.

*Guidelines for Maintenance Management in Water and Sanitation Utilities in Developing Countries.* Technical Report No. 63. June 1989.

*Application of the WASH Financial Management Guidelines to Indonesia's Autonomous Water Supply Enterprises.* Field Report No. 289. January 1990.

## ABOUT THE AUTHOR

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## **EXECUTIVE SUMMARY**

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These guidelines were prepared for evaluating the fiscal condition of water authorities and their supporting management systems and procedures. The main purpose of this document is to provide a tool to improve the efficiency of water services delivery through better management of financial resources. The use of the guidelines requires some ability in financial analysis and exposure to utility management.

The financial management assessment determines an authority's ability to perform the following seven functions:

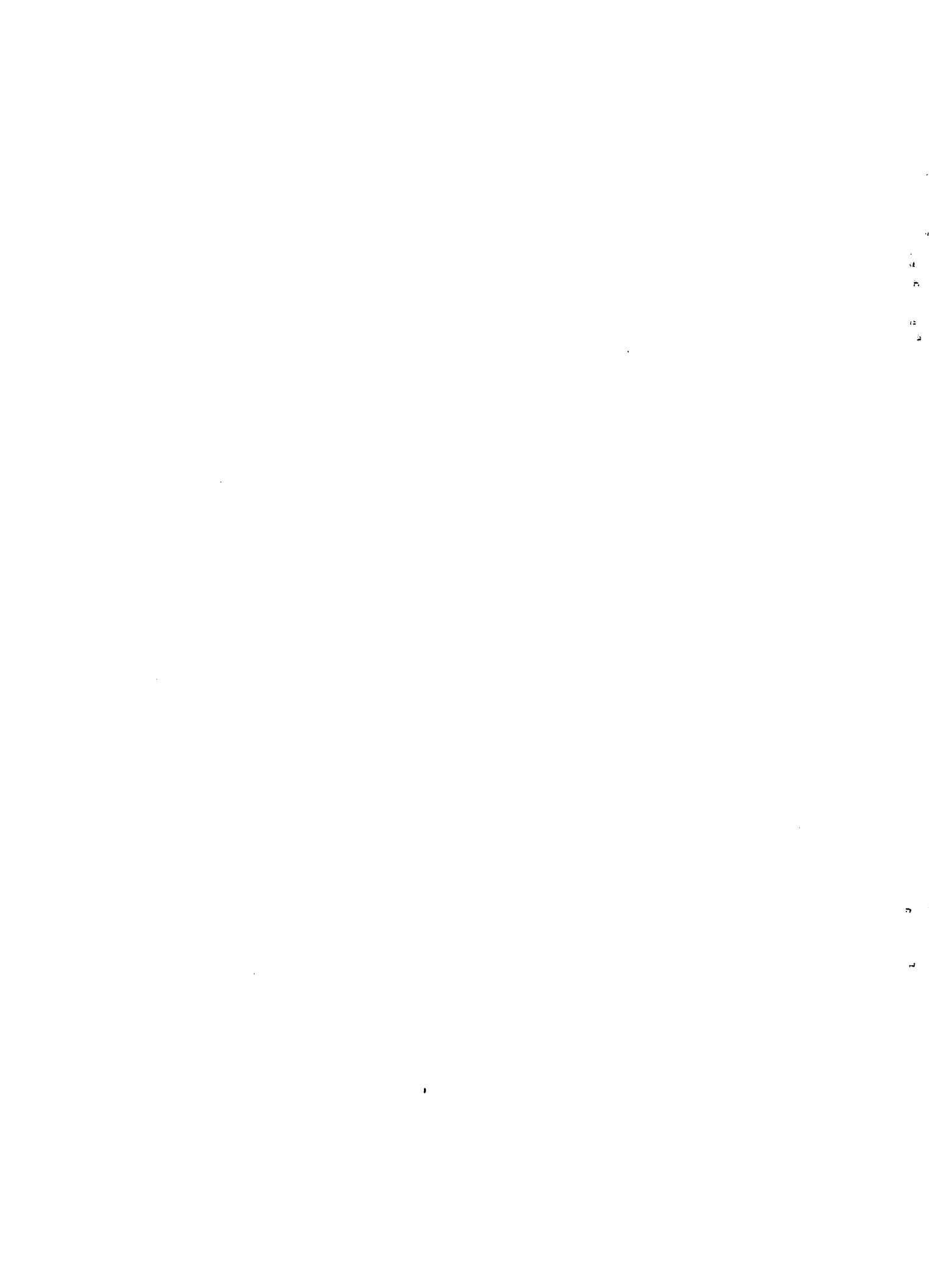
- Planning and budgeting
- Revenue estimation
- Purchasing or procurement
- Accounting
- Cash management and collection
- Debt management
- Auditing and reporting

It focuses on financial management practices, and distinguishes these from technical work and administrative tasks.

The guidelines provide a series of steps and estimates the time needed to complete them. In addition, a number of aids are offered to facilitate the assessment. These include a sample report outline and an analysis work sheet that can easily be accommodated to fit most computer spreadsheet programs.

The core of the assessment is the data collection guide (Chapter 4). The preliminary step is gathering information about the institution as a whole. Each subsequent section in this chapter corresponds to one of the seven management functions. For each function, suggested data collection questions and possible analytical issues which may arise are provided.

Chapter 5 of the guidelines describes the quantitative analysis that can be conducted with the data. Indicators of the financial condition of an authority, including income, expenditures, operating position and cash flow, debt structure, condition of capital facilities, and unfunded liabilities, are listed with an explanation of how these should be interpreted within the larger context of the assessment. A set of key financial ratios is listed in Chapter 6, grouped in three major categories to measure profitability, short-term liquidity, and long-term solvency. A subset of these indicators is presented for a quick overview of financial performance when a full and detailed review is not possible.



## **WASH FINANCIAL MANAGEMENT SERIES**

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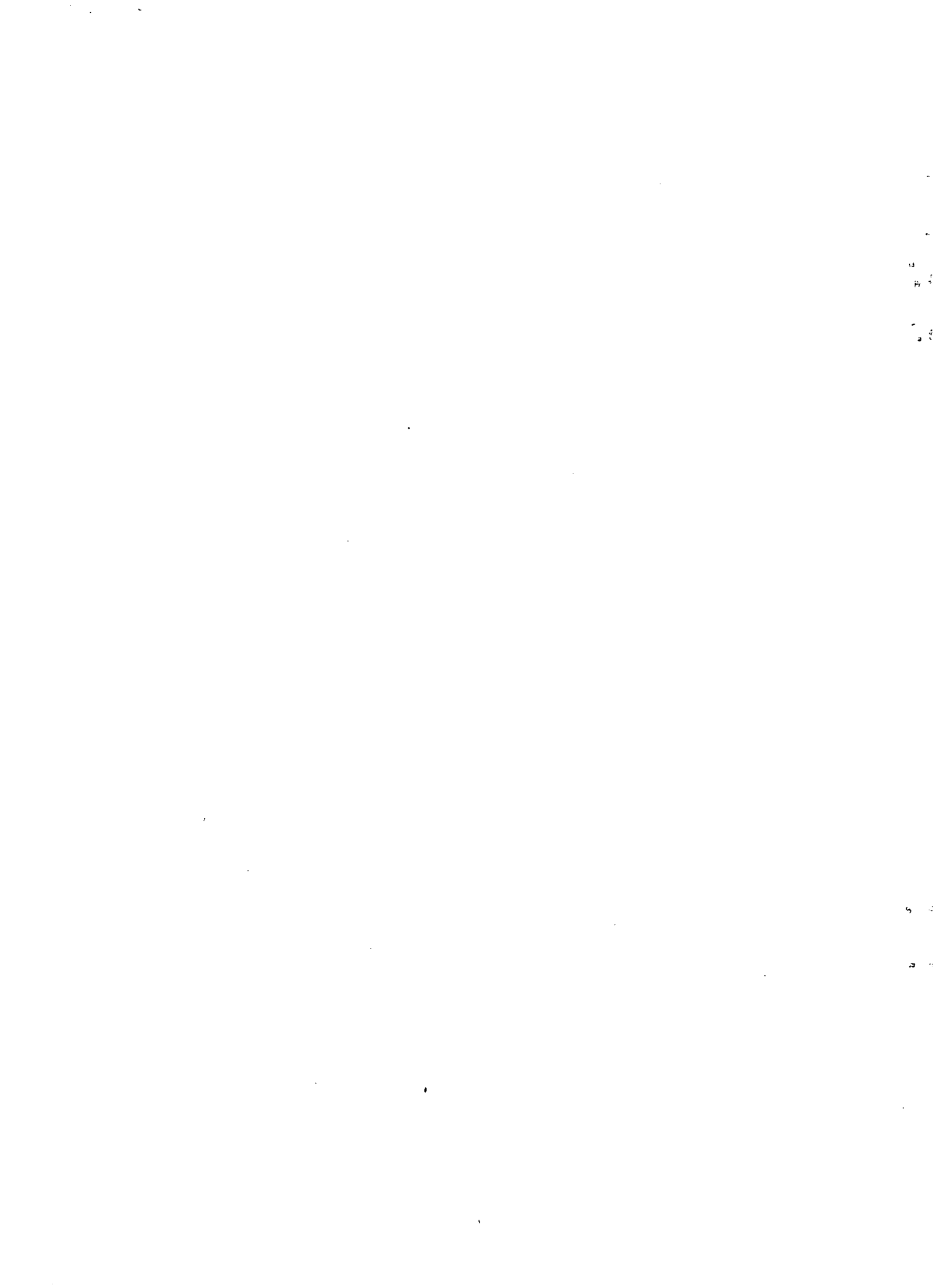
The Water and Sanitation for Health (WASH) Project is developing a series of publications dealing with financial management and cost recovery issues. Currently there are four reports in this series. Titles of these publications are as follows:

- Report 1      Guidelines for Conducting a Financial Management Assessment of Water Authorities
- Report 2      Guidelines for Cost Management in Water and Sanitation Institutions
- Report 3      Principles of Tariff Design for Water and Wastewater Services
- Report 4      Guidelines for Financial Planning of Water Supply and Sanitation Institutions (Planned)

The four reports provide an integrated package of financial and management assistance. The reports are prepared for audiences at varying skill levels within the financial discipline, both at the operational level and at the administrative level. They can be used individually or together. Report 1 is an assessment and diagnostic tool and would logically be the first report used to appraise the current financial management situation of a water supply institution. Weaknesses in cost management, tariff policy, and financial planning that are revealed in this initial assessment can be addressed by using the other reports in the series.

WASH is also able to provide a wide range of technical assistance publications and guidelines in a number of related disciplines. Specific examples include *Guidelines for Institutional Assessment: Water and Wastewater Institutions* and *Estimating Operations and Maintenance Costs for Water Supply Systems*.





# 1

## INTRODUCTION

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### 1.1 Financial Management Assessment—An Overview

These guidelines were prepared for evaluating the fiscal condition of water authorities<sup>1</sup> and their attendant financial management systems and procedures. A financial management assessment identifies managerial and administrative strengths and weaknesses in the following functional areas:

- Planning and budgeting
- Revenue estimation
- Purchasing or procurement
- Accounting
- Cash management and collection
- Debt management
- Auditing and reporting

Within each of these areas, this assessment includes a series of questions about financial management practices and suggestions for collecting financial and operational data. A series of performance ratios is then calculated to highlight the financial condition of the water authority.

The financial management assessment can be used for an existing authority that provides water service in either an urban or a rural setting, as well as for institutions that have broad water supply responsibilities or control multiple water systems. The term "authority" is used to describe each of these types of utilities. It is assumed that the authority is intended to be revenue-earning, that is, it assigns and collects fees or tariffs for the services it provides. It is with an eye toward gauging financial viability and continued operation of the water system that the assessment methodology has been developed.

Lending agencies have their own techniques of financial analysis to support investment decisions. While these assume the presence of specific financial management practices, there are few fully developed tools for examining an authority's total financial management capabilities which, in large measure, help to ensure successful cost recovery and the financial resources necessary to keep the system going.

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<sup>1</sup> Although this paper is focused on water supply institutions, many aspects of the assessment may be applicable to wastewater authorities as well.

A financial management assessment may be used as part of:

- Project design
  - Determining the financial capability of an authority to sustain its operations through the life of a project
  - Identifying potential areas for technical assistance and training
- An overall program or agency review
- Part of a loan appraisal

An assessment is not intended to audit the authority for financial compliance and accuracy (which is best left to professional auditors and accountants), but to determine its capacity to manage its finances and, coincidentally, to meet the requirements of such an audit. The assessment is to be used to help improve the delivery of water services through better management of financial resources.

## **1.2 How to Use These Guidelines**

The guidelines are presented in six chapters: introduction and overview; financial management functions; four major steps in performing a financial management assessment; data collection guide; analysis of financial indicators; and quantitative analysis based on financial ratios.

First-time users should review thoroughly all of the chapters to make certain that the framework is established; the last three will then be the ones most commonly referred to.

Use of the guidelines presumes a blend of technical utility management skills, a degree of financial expertise, and the ability to determine under what conditions the presence or absence of specific features of a financial management system can be expected within the context of the system under study. Thus, while this document provides the detail necessary to conduct a thorough and complete financial management assessment, it is not intended as a primer on finance or financial management.

### 1.3 Level of Effort

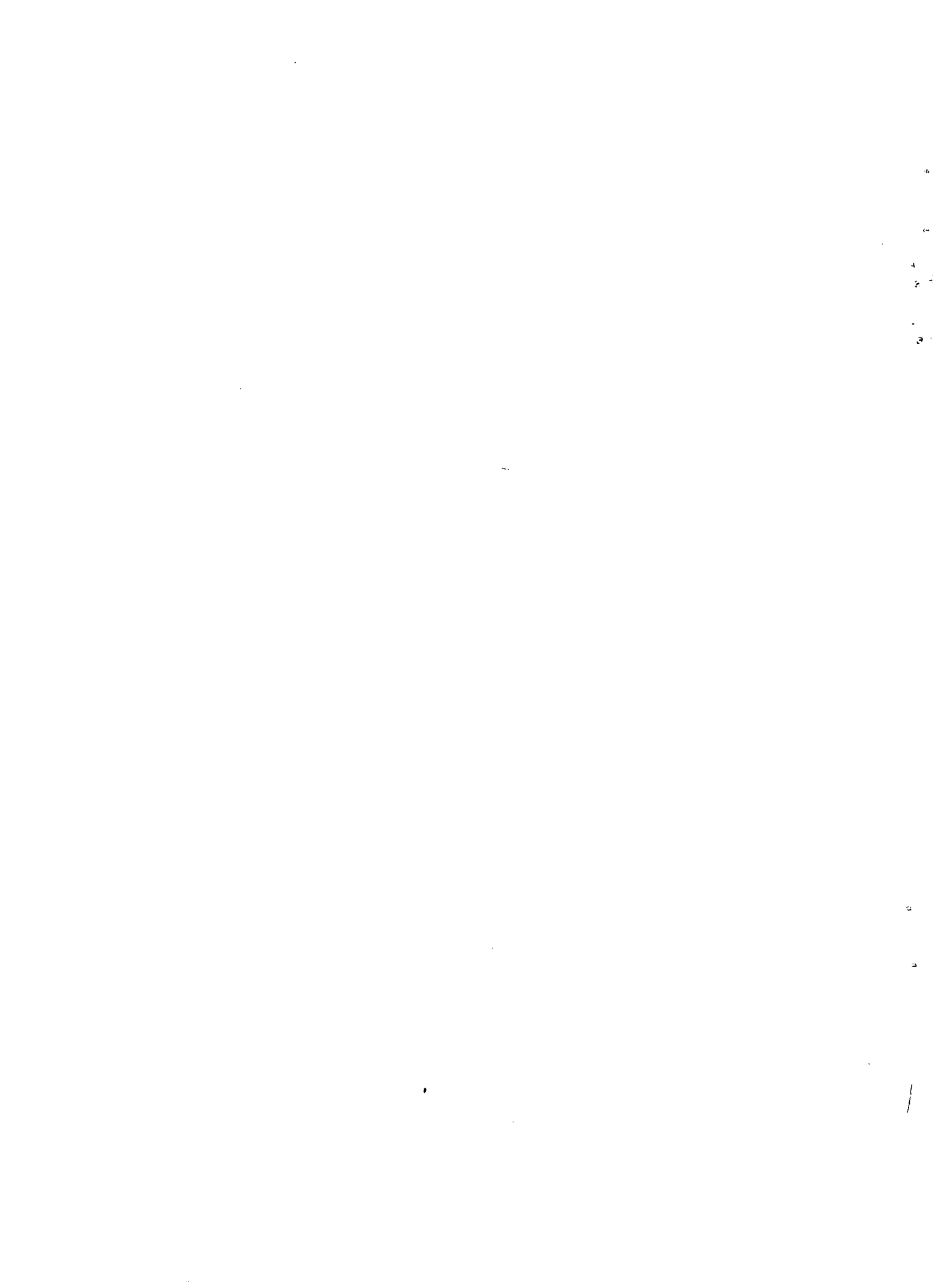
The time spent on the assessment will depend on the size of the authority and the level of sophistication of its financial management and accountancy systems. Computerized billing, management information systems (MIS), and other service systems will facilitate data collection. The size of the team will depend to a great extent on the availability of data.

The following time schedule is indicative. The time allocations suggested below are for one person but could be shared by several individuals of a team. Travel time is not included.

<u>Authority Characteristics</u>	<u>Size of Authority</u>		
	Small	Medium	Large
Connections (000s)	10-30	50-250	250-500
Population (000s)	50-100	200-500	500-1000
<u>Approximate Level of Effort</u>			
Field Work (days)	1-3	3-5	5
Total Days	5	10	15

### 1.4 Composition of the Field Team

The assessment is to be conducted fairly quickly, with preliminary results ideally available at the end of the data collection and analysis period. The individual or team undertaking the assessment must have experience in finance, budgeting, accounting, and service management of water authorities to provide perspective and interpretation of the results of the assessment as it progresses. The assessment provides a detailed set of questions and quantitative indicators as tools to complete the task within a limited time.



# 2

## THE FUNCTIONS OF FINANCIAL MANAGEMENT

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The financial management assessment focuses on the financial management practices and capabilities of a water authority. It distinguishes financial management activity from technical work and other administrative tasks.

The seven functions of financial management, discussed in these guidelines (see Box 1), serve as useful organizing principles for understanding the financial management capabilities of the authority. They are described in the subsections that follow.

### **Box 1: Functions of Financial Management**

1. Planning and Budgeting
  - Operations or Current Planning and Budgeting
  - Capital Facilities Planning and Budgeting
2. Revenue Estimation, Tariffs, and Collection
3. Procurement
4. Accounting
5. Cash Management
6. Debt Management
7. Auditing and Reporting

### **2.1 Planning and Budgeting**

Sound planning and budgeting involve four principal activities:

- Identifying the long-term service objectives of the authority
- Determining the capital costs for construction and acquisition required to meet those long-term objectives

- Developing a capital facilities plan (time-phased over at least five years)
- Programming specific service activities and their budgetary requirements for the current and next operating year

The first three activities define the capital planning and budgeting process; the last defines the current or operating planning and budgeting process.

For a water authority, the capital and current planning and budgeting processes are inextricably linked. The current operating budget covers the operation and maintenance of the capital facilities that provide water for customers, and the collection of appropriate fees for this service. Capital construction and acquisition plans, therefore, have direct implications for future operating budget requirements.

Sound current budgeting practice includes the use of accounting-based historical cost information on each district service activity to develop annual budgets based on the planned volume and quality of service to be delivered.

## **2.2 Revenue Estimation, Tariffs, and Collection**

Conventionally, revenue estimation consists of multiplying the tariff or fee by the projected number of customers. Actually, it is a more involved process. The number of customers by usage category (household versus industrial, for example), the amount of usage (some authorities have different scales depending on quantity consumed), and tariff setting are all part of the process. Pricing water correctly through an appropriate tariff structure is a major part of operating an efficient utility. An operational guide to tariff design is set out in Report 3 of the WASH Financial Management Series: *Principles of Tariff Design for Water and Wastewater Services*.

Specific to revenue estimation for water authorities is the issue of unaccounted for water (UFW). UFW includes both system losses and water that is consumed but not billed. A reduction in system losses generally increases the water available for current sales and defers capital requirements for the construction of additional capacity. A decline in system losses will also reduce production requirements and decrease variable costs of production for pumping and treatment (i.e., for purchase of chemicals).

The most frequent explanations for UFW have been identified by the World Bank and others as leaks and losses, inaccurate metering, and illegal use. Leaks and losses are classified as technical losses and include water for fire fighting, street cleaning, and system flushing, as well as actual losses from broken and badly maintained pipes. This is water that is not consumed. Metering mistakes and illegal use are referred to as nontechnical losses and account for water that is consumed but not billed.

All UFW represents nonrevenue water. A standard definition of UFW is metered water production to the distribution system less metered sales. Where meters are unreliable or not all consumption is metered, consumption estimates can be questionable. Studies show that high values of UFW are often the result of management and sales system failures and not because of technical losses.

Further, with regard to rate determination, willingness to pay has become an important issue, particularly in designing new systems and choosing the correct level of service. (See WASH Field Report No. 213: *Willingness to Pay for Water in Rural Areas: Methodological Approaches and an Application in Haiti.*) Revenue estimations should not rely on historic projections.

Revenue collection, including appropriate metering, billing, and collection systems, is the second key to ensuring that the authority has the resources it needs. Sound financial management implies that the authority collects what it is owed in a timely fashion and has the information to track delinquent accounts.

### **2.3 Procurement**

Procurement involves the acquisition of goods and services to support the objectives of the authority, and may include expendable materials and supplies or capital equipment with a specified service life.

Sound and uniform procurement policies and procedures must govern all purchases. If the authority is an independent entity, purchasing rules and regulations may be developed internally and administered by a purchasing agent. If it is part of a larger entity, for example, a municipality, a regional government, or an organization at the national level, its purchasing procedures may be governed by this larger entity, with its representative providing input to the central purchasing agent. In either case, sound financial management dictates the need for reliable records, inventories, and vendor supply lists, and attempts to achieve economies of scale in purchasing.

### **2.4 Accounting**

Accounting activities include recording all financial transactions as they occur, organizing financial information for easy retrieval, and providing summaries and reports useful to those seeking them.

These activities support the three most common types of accounting: cost accounting, financial accounting, and managerial accounting.



Cost accounting is the most specific and includes cost control, analysis, and information to guide pricing. It is concerned with the resources consumed during the course of the activity, that is, something becomes a cost when it is used or consumed, not when it is purchased or paid for.

Financial accounting includes information that determines the financial position of the authority and is reported to persons outside the authority.

Managerial accounting includes information to support internal decisions. It is concerned with the "design, installation, and operation of financial planning, budgeting, and accounting systems; the use of appropriate methods and techniques to monitor and control all aspects of financial operations; and the coordination of these systems, methods, and techniques with the primary activities" of the authority (World Bank, 1982).

An authority should use all three types of accounting, which are complementary. The foundation of sound accounting practices is the accounting system, which may be either developed internally or prescribed by a national charter or code of accounts. The system is the means by which information is collected and reported.

Generally accepted financial accounting principles call for identifying accounts by fund, type of account (revenues or assets, for example), department or activity, and object or source, which parallel budget line items. These principles also require that the basis of accounting be consistent, whether accounts are maintained when expenditures are made (cash basis) or when they are committed (accrual basis), or on a modified accrual basis compatible with budget control.

## **2.5 Cash Management**

An authority must control revenues and expenditures so as to ensure its ability to meet current obligations and maximize funds available for investment. Factors that influence the availability and timing of cash include billing, collection, deposit, and disbursement procedures.

Forecasts of cash flow, including revenue (income) items and expenditures, should be developed to determine trends and projections based on the budget. Excess cash should be invested, if possible (and legal), through relatively secure investment vehicles with varying degrees of liquidity. In this way, an authority has additional investment income as well as access to funds for immediate expenditures. Finally, banking practices and services are important components of cash management because they may influence the amount of cash needed to be kept on hand.

## **2.6 Debt Management**

Within the confines of statutory and regulatory restrictions, authorities may find the need to borrow either in the short or longer term. Short-term debt is used to satisfy shortages in cash flow. Longer-term debt places claims against future revenues and is used to finance capital expenditures with a specific (long) life span.

Debt in and of itself does not constitute poor financial management; to the contrary, an authority can seldom earn, retain, and invest sufficient funds to finance capital expenditures out of current accounts. Also, the timing of revenues and expenditures may not always coincide, making short-term borrowing to meet payroll, for example, a practical necessity. Sound debt management, however, is essential to ensure the continued credit worthiness of the authority, and includes documentation and accurate and timely payment of both principal and interest.

## **2.7 Auditing and Reporting**

In the strictest sense, an audit is a written report of the examination of an authority's accounting practices to determine the accuracy of its financial statements. It is conducted by an independent and qualified person, but does not provide any indication of future financial prospects or efficient or effective performance. Audit requirements may vary from country to country in terms of content and level of detail, and the quality of the audit may vary as well.

In addition to the official external audit, an authority may employ an internal auditor to determine the extent to which its systems and controls contribute to effective financial management. The internal audit includes a review of the reliability and accuracy of the accounting system and associated reports, compliance with policy and procedures, and methods for improvement.

Reports are the means by which both management and the outside world gain an understanding of the authority. Internal management reports should parallel the financial management functions, covering budgets, monthly use of services and revenue earned, purchases and inventories, payroll, cash management and account delinquency rates, and outstanding debt and payments due.

The three major elements that should constitute the external reports of an authority are a statement of financial position (balance sheet), a statement of net income (income statement), and a statement of changes in financial position (cash flow). These statements, or their equivalents, generally appear in an annual report along with the appropriate notes and explanations.

It is important to ascertain whether these reports are available and to obtain copies for the most recent years, if possible. In a few instances they may be unavailable because they do not exist, in others because there is a reluctance to have them examined. This reluctance often can be attributed to a fear of evaluation.

## **2.8            The Financial Management System**

Financial management functions are not performed in isolation from each other or from other technical and operational aspects of the authority. The accounting system, for example, provides the information for effective purchasing and cash management. Planning and budgeting should guide purchasing and debt decisions. Individual managers may have more or less authority for each of the management functions. Regardless of the organization's size or structure, these functions must be performed.

# 3

## HOW TO CONDUCT A FINANCIAL MANAGEMENT ASSESSMENT

The four major steps in conducting a financial management assessment are shown in Box 2.

### **Box 2: Major Steps and Estimated Time Required for a Financial Management Assessment\***

Step 1. Organize the Assessment	1-2 days
<ul style="list-style-type: none"><li>• Determine Purpose and Audience</li><li>• Collect Background Documentation</li></ul>	
Step 2. Collect Information and Data	1-4 days
<ul style="list-style-type: none"><li>• Identify Key Individuals and Institutions</li><li>• Determine the Context in Which the Authority Operates</li><li>• Collect Oral and Written Data</li></ul>	
Step 3. Perform Analysis and Synthesis	1-4 days
Step 4. Prepare the Report and Recommendations	2-5 days
Total	5-15 days
* See Section 1.3 for more detail on estimated level of effort required.	

### **Step 1. Organize the Assessment**

#### **Determine Purpose and Audience**

The initial task is to understand why and for whom the assessment is being done. The purpose of the assessment and its audiences are important for two reasons.

**First**, it can affect the degree of access to information. The assessment team should remain dispassionate, while making clear to assessment participants and respondents that the assessment is intended to be constructive, not punitive, particularly if it is being conducted at the behest of upper management.

**Second**, the rationale and audience for the assessment will influence the nature and direction of the recommendations in terms of those that would require outside financial or technical assistance and those that could be implemented internally.

A careful financial management assessment will systematically address all of the applicable issues contained in these guidelines. Its purpose and audience should not influence either its contents or findings. Specifically, the assessment gathers information on

- Functions the authority performs
- Specific legal and regulatory provisions that affect the authority's ability to carry out its roles
- The role of various national, regional, or local government institutions in regulating and providing technical and financial assistance to the authority
- Political and structural features of the authority
- The level of technical knowledge of principal financial management staff
- The authority's financial management system
- Financial and operating characteristics of the authority

### **Collect Background Documentation**

The next task is to collect, prior to the site visit, documentation concerning the authority and its financial system. Sources of this information include project feasibility documents, project design documents, project or program evaluations, financial and institutional analyses conducted by lending agencies, and enabling legislation.

## **Step 2. Collect Information and Data**

### **Identify Key Individuals and Institutions**

In many instances, a national agency such as a water and sewerage board, ministry of public works, or parastatal organization has an oversight role vis-a-vis water authorities. But the authorities may also be independent entities of local government or private organizations.

It is necessary to identify the institutions that have the most extensive and authoritative relationships with the water authority and the personnel to be interviewed. *Make a list of institutions and personnel.* Interviews are intended to elicit information on current policy, planned changes, and opinions about the ability of the authority to carry out its present responsibilities and possibly take on more. They are also designed to gather basic background data on the authority.

Assessing the role of overseeing agencies has important implications for the results of the assessment. In many countries, national-level institutions play a significant role in financing and assisting water authorities. Legislation or regulation and the actions of national institutions are sometimes a major constraint, and in other cases a major facilitator, in service functioning. Before assessing the financial management of an authority, it is important to have a clear idea of the national context, which may be important in interpreting the responses of water service officials to questions raised during the assessment.

The assessment begins with the director or head of the authority and perhaps the members of the governing board or council. The director should provide pertinent information regarding the fiscal and service responsibilities of the authority, the personnel in charge of each of the financial management functions, and the relationship between operational and financial activities and personnel. With this information, interviews and data collection schedules can be developed.

### **Determine the Context in Which the Authority Operates**

This includes:

- The legal status of the authority, which defines the degree of autonomy it has to contract, to sue and be sued, and to determine its own financial policies. Government control, the specified code or charter of accounts, and rules and regulations concerning parastatals may each affect the level of autonomy in financial management.
- Any legal or statutory requirements to which the authority must adhere. It is important to identify the extent to which such requirements affect financial management. The ability of the authority to fix tariffs or user charges, for example, or to borrow and the limitations on that borrowing, is determined by a variety of statutes that may include banking laws as well as specific requirements for the utility. Equally important are rules that may waive specific reporting requirements.

## **Collect Oral and Written Information**

The next step is to interview the principal personnel identified by the director and any additional personnel referenced, and to obtain documentation as described in the data collection guide contained in Chapter 4.

### **Step 3. Perform Analysis and Synthesis**

Application of the material in Chapter 4 permits assessment of the financial management system, information flow, measurement and reporting, and practices and procedures, any or all of which may range from exemplary to problematic to nonexistent. Recognition of the interrelationship among the functions is one indication of a successful financial management system. The analyst should probe to ascertain that, at whatever level and in whatever form, there are planning and budgeting, revenue and expenditure, purchasing and procurement, accounting, debt management, cash management, and auditing and reporting efforts in place.

Most of the substantive results of the assessment will come not from responses to the questions but from interpretation of these responses. *Vague, difficult-to-obtain, or inconsistent data or information should be signals that the financial management practices deserve close scrutiny.*

In addition to the policy and procedural aspects of the financial management system, specific quantitative analyses should be conducted that measure the fiscal condition of the authority. These are detailed in Chapters 5 and 6.

The policy and procedural elements and the quantitative measures should be carefully integrated. Indications of poor fiscal condition (increasing operating deficits, for example) may be the result of financial policy and procedures that are not implemented completely, are implemented incorrectly, or are nonexistent. Of course, they may also be the result of technical operating procedures or practices. The question is whether the operational issues are the result of financial constraints. The analysis relies on the synthesis of *all* the information obtained.

### **Step 4. Prepare the Report and Recommendations**

#### **Report Outline**

Documentation of the financial management assessment is probably best organized according to the needs of the client for whom the assessment is being conducted. Box 3 sets out a suggested outline which covers the main issues.

## **Recommendations**

The assessment will help to determine an authority's capacity to carry out financial management responsibilities, and should provide direct inputs into technical assistance and training strategies, including:

- Necessary policy and legal changes
- Recommendations for development of performance measures and standards to improve cost effectiveness
- Recommendations on possible changes in each of the functional areas

The purpose and audience of the assessment will influence the nature and direction of recommendations. These may be:

- Recommendations that can be implemented immediately by changes in internal procedures and practices and with internal resources. Examples include calculation of statistics from existing data, enforcement of collection policies, changes in the roles and responsibilities of staff.
- Recommendations that require legal or policy changes by some external body. Examples include the authority to incur short- or long-term debt, and relationships with banking and lending institutions.
- Recommendations that require external technical and financial assistance. Examples include training, and assistance in automation and systems design.



### **Box 3: Suggested Financial Management Assessment Report: Annotated Outline**

#### **I. Executive Summary**

#### **II. Purpose of the Assessment**

- Discuss program and policy issues that led to the assessment.
- Provide a rationale for the report's objectives.

#### **III. Introduction and Background**

- Examine the role of the national public administration.
- Identify the existing constraints on authority's ability to perform its role.
- Identify the role of other public sector institutions in providing funds, technical assistance, etc.
- Detail the legal or statutory requirements and the legal status of the authority.
- Give pertinent financial regulations.

#### **IV. Financial Management Functions**

##### **1. Planning and Budgeting**

- a. Operations or Current Budgeting
- b. Capital Facilities Planning and Budgeting

##### **2. Revenue Estimation and Collection**

##### **3. Procurement**

##### **4. Accounting**

##### **5. Cash Management**

##### **6. Debt Management**

##### **7. Auditing and Reporting**

- Include the specific findings regarding each of the financial management functions.
- For each section, state the strengths and weaknesses and technical needs.

#### **V. Analysis of Fiscal Condition**

- Give the quantitative counterpart to Section IV.
- Provide summary statements of quantitative analyses that are to be presented as technical appendices.

#### **VI. Conclusions and Recommendations**

#### **Appendices**

# 4

## DATA COLLECTION

---

This chapter contains data collection instructions as well as a comprehensive list of questions which correspond to the seven financial management functions (see Box 1). This information is used for Step 2, "Collect Information and Data." Questions for each function are set out on separate pages for ease of use.

The assessment begins with institutional-level information obtained from questions asked of the director or head of the authority. After this, a schedule of interviews and a data collection timetable can be arranged with the authority. This provides an interval in the data collection activity before the user continues with questions on the seven financial management functions.

All the sections of the data collection guide are arranged in the same way. For every issue or function, a list of the documents to be obtained and questions to be asked of the appropriate official(s) are included. These questions are labeled "data collection" and are not intended to be asked verbatim. They should be phrased in the way that is most comfortable and appropriate to the interview setting. Not *all* questions are appropriate for *all* institutions.

Immediately following the data collection section is a list of analytical issues that provide guidance in interpreting and analyzing the responses to the questions and to the data collected. They are for use in Step 3, "Perform Analysis and Synthesis."

Most, although not all, of the questions assume a "yes" or "no" response. They have been written in this way to promote analysis. A negative response in most cases implies a practice or procedure that could or should be implemented. In other words, each issue being questioned is characteristic of a sound financial management practice. Water authorities in developing countries may not have many of the programs or policies included here. Some may have them at varying levels of complexity in manual or computerized systems maintained by one or several individuals. Each of these functions and characteristics should be considered as part of the financial management assessment and may help to identify areas for improvement, training, or technical assistance, as well as areas of strength and success.

It is often useful to organize the data collection around a focal point that has particular importance for the local authority, such as a problem it has already identified or a trend analysis of its financial performance. In this way, the assessment becomes a meaningful exercise for the authority staff and not merely another study imposed by outsiders.

Appendix A describes the application of these guidelines to a test case in Indonesia that used such a focal point. The assessment began at a workshop that focused on developing a set of key financial performance indicators for the previous three years. The workshop, attended by managers and key senior staff of the authority, produced data on 27 indicators (written up on a "white board") and charted changes in the financial performance of those indicators. As the performance indicators were calculated and recorded on the board, the reasons for changes in performance were noted and analyzed.

This process was used to structure the data collection. Virtually all the questions in the guidelines were covered. The process drew the authority staff into the assessment as active participants and made clear why certain questions were being asked. It also kept the assessment anchored in objective measures of performance and made it difficult for the authority staff to gloss over problems of performance. For more information on the approach used in the Indonesia case, the reader is referred to Appendix A and WASH Field Report No. 289, *Application of the WASH Financial Management Guidelines to Indonesia's Autonomous Water Supply Enterprises*.

# INSTITUTIONAL-LEVEL DATA GATHERING

## DATA COLLECTION

- a. Obtain an organization chart for the authority and identify the principal actors in the financial management system.
- b. Obtain copies of all legal, statutory, and regulatory documents that affect financial management of the authority.
- c. What is the legal status of the authority (for example, parastatal, cooperative, ministerial-level department, private corporation, public utility, etc.)?
- d. Is the authority dependent on appropriations by some other body (for example, national assembly, ministry, etc.) for its budget?
- e. Can the authority fix tariffs or set user charges?
- f. Which external agencies or institutions influence the authority in policy, financial, and regulatory matters?
- g. Which financial officials maintain contact with the decision makers of the authority?
- h. Can the authority borrow? If so, what are the terms and conditions of the "lending window" of each lending institution, including:
  - Interest rates
  - The percentage of total project cost that may be borrowed
  - The extent of matching requirements
  - The extent to which the authority may meet part of project costs through noncash contributions, such as labor
  - Limitations on the total amount of indebtedness

- The extent to which interest rates and other terms coincide with current market interest rates (that is, the degree of subsidy)
- i. Does the authority have the autonomy commensurate with its responsibility to provide services to make operating and budgeting decisions and control expenditure levels?
- j. How do capital budgets fit national development strategies? Are priorities determined, controlled, or affected by central planning (e.g., five-year plans)?
- k. Are there any sources of technical assistance in financial management for the authority?
- l. Are there any specific mandates and responsibilities for the authority in terms of population coverage, service types or levels, or consumer priorities?

#### **ANALYTICAL ISSUES**

- What is the legal status of the authority and are there any constraints under which it must operate in financial matters?
- How much autonomy does the authority or its individual systems have?
- What is the operating mandate of the authority?

# PLANNING AND BUDGETING

## OPERATIONS OR CURRENT BUDGETING

### DATA COLLECTION

- a. Is there a standard budgeting form and process? (Obtain a copy of the budget and procedures, if available.)
- b. Is the budget prepared according to this process, using an established schedule and the prescribed form?
- c. Are the budgeting form and process perceived to be workable in the view of budget personnel?
- d. Is the operating budget formulated by organizational unit, work activities, or program goals?
- e. Who contributes to budget preparation? Are line managers included?
- f. Is planning information (for example, population projections, shifts in geographic concentration, changes in the economy, fluctuating foreign exchange rates that may affect costs) used to prepare estimates?
- g. Do donors or lending agencies control programs and this budget?
- h. Is information on unit cost for services available and used to measure aggregate budget totals?
- i. Are maintenance records maintained and used to estimate next year's maintenance requirements and costs?
- j. Can the authority control all costs (for example, salary levels)? If not, what proportion of total costs is uncontrollable?
- k. Is the first year capital budget included in the operating budget, or are the two combined in an overall annual budget?
- l. Is the accounting information for the planning and budgeting process up to date? Is it accurate? Is it readily available?

- m. Are there procedures for determining the operating and maintenance implications of capital budget expenditures and for estimating current budget impact for the budget year and succeeding years? If so, who does the analyses?

#### **ANALYTICAL ISSUES**

- What seems to be the dominant orientation for budget decisions (for example, incremental deviations in line items from previous budgets, volume of services to be delivered and unit cost estimates, end product, or program accomplishments)?
- What is the proportion of current or operating budget attributable to personnel and benefits costs?
- What are the major strengths and weaknesses of the current budgeting process in terms of communication within the authority and with external bodies, as they affect data availability and its timeliness and accuracy, analysis, and staffing?

#### **CAPITAL FACILITIES PLANNING AND BUDGETING**

##### **DATA COLLECTION**

- a. Is there a capital facilities inventory or fixed assets ledger? If there is, obtain information on it.
- b. Is it complete? Does it include the following:
- Age of each asset (that is, original construction date and reconstruction date, if any)
  - Expected life span at construction and reconstruction
  - Construction of material
  - Construction cost (or purchase price)
  - Replacement cost

- Maintenance schedule and maintenance record
- c. Is there a process for determining the need for new facilities or reconstruction of capital facilities?
  - d. Is the process sensitive to the type of information in an inventory of assets and to changing conditions (for example, population change, increasing risk of health and safety problems, increasing demand for services)?
  - e. Is there a defined planning period? What is the long- and short-term planning horizon? (For how many years are needs projected? For how many years are cost estimates prepared? For how many years are detailed designs and specifications prepared?)
  - f. Is there a process for determining priorities? Is it quantitative? (Is some form of capital budgeting, present value analysis conducted?)
  - g. Is there a policy for financing these capital projects?
  - h. Are individual projects identified in the budget?
  - i. Are capital projects appraised for technical, financial, and economic viability?
  - j. How are budgets projected over several years as a base for estimating the impact of additional long-term debt (if such debt is authorized)?

## ANALYTICAL ISSUES

- If there is no reliable list of fixed assets, a warning flag should be raised.
- Is citizen input regarding capital facilities, needs identification, and priority setting adequate?
- Are operation and maintenance costs for each capital project, including estimates for the useful life of the facility (equipment), identified in such a way as to provide useful inputs into the current budget planning process?



- Are mixed sources of funding (for example, current budget surplus, sinking funds, and grants) evaluated for their varying impacts on the budget and its overall financial situation?
- Are capital projects of donor and lending agencies considered independently of each other and of the system as a whole?
- What is the impact of varying loan and grant conditions and requirements on planning and budgeting?
- What are the major strengths and weaknesses of the capital budgeting process in terms of communication within the authority and with external bodies, as they affect data availability and its timeliness and accuracy, analysis, and staffing?
- How is depreciation calculated? Straight line? Sum of the digits? Declining balance? How are depreciation calculations used?

# REVENUE ESTIMATION AND REVENUE COLLECTIONS

## REVENUE ESTIMATION

### DATA COLLECTION

- a. Does the authority estimate future revenues by major revenue source? Who makes these forecasts?
- b. Do the forecasting methods take into account changes external to the authority (for example, rate of new business formation, rate of decline in economic activity, inflation rates, foreign exchange rate fluctuation, national policy)?
- c. Do the estimation methods take into account collection practices and overall collection efficiency?
- d. Have the estimates by major revenue item been accurate in preceding years?
- e. How are tariffs or fees set? Do they cover costs? Do they depend on subsidies? If so, from where?
- f. Are rate studies conducted regularly to determine whether rates cover costs adequately?
- g. Does the rate determination study take into account all costs—direct, indirect, and capital?
- h. How many connections does the authority service? What does this represent as a percentage of the population? What is the percentage breakdown by type of connection (for example, residential, institutional, commercial, industrial)?
- i. Are records maintained for determining the use by customer and customer type?
- j. What proportion of connections is metered? Are outflows metered at the start of the distribution system?
- k. Is there a replacement schedule for meters? Are there repair facilities for meters?

1. Is unaccounted for water or non-revenue water monitored?

## **ANALYTICAL ISSUES**

- Who makes the final decision on what estimates to include in the annual budget and, if the estimation staff disagree, whose judgment is finally accepted?
- Are the estimation staff in communication with revenue collection and other policy staff?
- Are there pressures to produce optimistic-versus-realistic revenue estimates? Are there ways to alleviate these pressures?
- To what extent are various forms of sensitivity or what-if analyses performed, and how are they presented to the relevant policymaking bodies?
- What are the major strengths and weaknesses of the revenue-estimation process in terms of communication within the authority and with external bodies, as they affect data availability and its timeliness and accuracy, analysis, and staffing?

## **REVENUE COLLECTIONS**

### **DATA COLLECTION**

- a. What is the method of billing (for example, meters or flat rates)?
- b. How is revenue collected (for example, bill collectors, payment offices, or mail)? How are bills sent out?
- c. Are records of revenue obligations of individuals, organized entities, and locations linked to show obligations, receipts, and arrears by the liable individual or group?
- d. Are there sanctions in the case of late or nonpayment?
- e. Is there a collection enforcement program?

- f. Is there a difference in the official and actual length of time between a payment becoming due and action to collect?

## ANALYTICAL ISSUES

- How effective are methods for clearing delinquent accounts?
- How effective are collections, including the following (see Chapter 5 for calculations to be performed):
  - Collection efficiency = the ratio of total charges due to bills collected
  - Billing efficiency = the ratio of total bills due to bills collected.
- Are analytical studies performed to relate the cost of providing a service to the cost imposed on the user? If so, what do they show?
- Are analytical studies performed to relate the cost of collecting a fee or charge to the revenue received? If so, what do they show?
- What are the major strengths and weaknesses of the revenue collection process in terms of communication within the authority and with external bodies, as they affect data availability and its timeliness and accuracy, analysis, and staffing?



# PROCUREMENT

## DATA COLLECTION

- a. Is purchasing centralized? Where?
- b. Is centralized purchasing used for materials only, contracts only, or both?
- c. Are multiple vendors and multiple bids sought?
- d. Are there bidding specifications (lowest purchase price versus lowest life-cycle cost, and detailed design specifications versus performance specifications)? Where appropriate, are life-cycle cost specifications considered in either seeking or evaluating bids?
- e. Is there a purchasing plan?
- f. Are there written policies to govern purchases of different values?
- g. Do purchase orders specify:
  - Quantity, unit price, and total price of order
  - Name and address of vendor and contact point
  - Anticipated date of delivery and location
  - Account to which purchase is to be posted?
- h. Are materials purchased in sufficient volume to achieve economies of scale in purchasing?
- i. Are receiving reports maintained on all purchases?
- j. Are physical inventories made annually and verified?
- k. Is there a method for measuring inventory loss?
- l. Are inventory costs considered in decisions about amount and frequency of purchases?

- m. Does the inventory system permit assignment of minimum and maximum stock quantities?
- n. Is there a method for disposing of excess inventory or fixed assets?

#### ANALYTICAL ISSUES

- Is there opportunity for achieving additional economies of scale by more centralized or more volume-based purchasing?
- Are storage facilities adequate and safe against loss or deterioration? Are control procedures adequate to permit a greater degree of volume purchase and storage?
- Are there delays in carrying out work while permission is awaited to buy, or obtain from inventory, materials and minor equipment? Are the officials responsible for purchasing aware of such delays?
- Are local vendors available, and are they willing to offer the same unit prices for smaller lots so that the authority, in effect, can leave them to hold the inventory?
- What are the major strengths and weaknesses of the purchasing, procurement, and inventory control processes in terms of communication within the authority and with external bodies as they affect data availability and its timeliness and accuracy, analysis, and staffing?

# ACCOUNTING

## DATA COLLECTION

- a. What is the main function of the accounting department (for example, to control or limit expenditures, provide management information related to costs, ensure the legal basis for expenditures)?
- b. Are there periodic reports on actual expenditures, encumbrances, and revenues against budget?
- c. After the budget has been approved, is spending authority allotted by periodic intervals during the fiscal year so that respective cost centers know their spending limits?
- d. Are departmental, divisional, or unit accounts kept at the lowest level matching authority to spend?
- e. Are department heads or other managers allowed to reallocate funds within appropriations without approval from upper management? To what degree?
- f. What is the primary basis for accounts (for example, cash, accrual, cost, other)?
- g. Are accounts matched with present or potential measures of volume (at a level at which the amount of work and the cost to carry it out can be identified)?
- h. What is the accounting period? How long does it take to close accounts?

## ANALYTICAL ISSUES

- Are accounting reports adequate to prevent obligations in excess of budgeted expenditures?
- Are accounting procedures (for example, pre-expenditure allocations and controls) adequate to prevent deliberate or accidental misappropriation?



- Does the accounting system provide data on expenditures and encumbrances not only for each appropriation account but also by work activities, program elements, and special projects?
- Is there a capacity to generate the data required to determine the full costs of individual programs, activities, and special projects?
- Is accounting viewed as limited to financial controls or is it an element in providing management information for decision making? What are the constraints to making the accounting system more responsive?
- What are the major strengths and weaknesses of the accounting system in terms of communication within the authority and with external bodies, as they affect data availability and its timeliness and accuracy, analysis, and staffing?

# CASH MANAGEMENT

## DATA COLLECTION

- a. How and where are cash accounts kept?
- b. Are receipts given for all transactions, such as official receipts or water bills? Are revenues deposited on the day received? Are they recorded immediately?
- c. How long does it take for revenue receipts to be deposited in appropriate accounts so as to be available for expenditures, investments, and short-term interest-bearing deposits?
- d. Are cash account balances ahead of monthly cash disbursements? How far ahead (or behind)?
- e. Are cash overages and shortages promptly recorded? Are they investigated to determine their cause?
- f. Do persons whose responsibilities require them to hold cash take appropriate precautions to protect funds in their care (for example, bag in safe or vault)?
- g. Is there an opportunity for short-term investments (especially using reserves in noninterest-bearing accounts)?
- h. Is there a formal investment policy? Does it have risk/return objectives? Are funds combined for investment purposes, with interest assigned to the various participating sources?
- i. Does the authority deal with a single bank? Within the law, was it competitively selected?
- j. Are all disbursements, except from petty cash, made by check?
- k. Do persons who sign checks review original papers, invoices, or other supporting documents to ensure that disbursements are in order before signing checks?
- l. Has the bank been furnished with current authorization of signers and countersigners of checks?
- m. Are bank reconciliation reports prepared regularly (preferably monthly)?

## ANALYTICAL ISSUES

- Are reserves sufficient to respond to cash flow problems? (How many months of cash outflow are available and what is the historical experience with this reserve)?
- Are controls on cash accounts in accordance with the form of appropriation or enabling legislation? Is the method of accounting sufficient to reconcile cash disbursements with legally appropriated purposes?
- Are clearance and control of cash disbursements slow and complicated so as to encourage informal attempts to bypass the authority or to discourage vendors from working with the authority?
- Are clearance and control of reimbursements timely or slow and complicated, indicating a rigidity in some cash management?
- What are the major strengths and weaknesses of the cash management system in terms of communication within the authority and with external bodies as they affect data availability and its timeliness and accuracy, analysis, and staffing?

# DEBT MANAGEMENT

## DATA COLLECTION

- a. Are all long-term and short-term debts monitored?
- b. Are there local or national requirements on the level of long- and short-term indebtedness (for example, expressed as a percentage of current revenues)?
- c. Does the authority use long-term debt instruments for capital financing?
- d. Is short-term debt retired within one year? Is it limited to less than half of the anticipated fee (user charge) revenue?

## ANALYTICAL ISSUES

- Are national restrictions on the amount of indebtedness too restrictive to allow discretion? Alternatively, is the authority overextended?
- Could the authority invest in a larger infrastructure if existing revenues were leveraged by use of credit?
- Does the authority project future revenue and expenditure patterns to assess the impact of additional borrowing on future financial condition?
- Do there appear to be adequate sources of credit available and are authority officials aware of these?



# AUDITING AND REPORTING

## DATA COLLECTION

- a. Are the accounting system and its records and procedures audited annually by an independent entity? Is that entity private or part of the central government?
- b. Does the authority have internal auditors to conduct periodic reviews of the financial operations of selected activities and units?
- c. Are internal audits ever made on a surprise basis?
- d. Is there a program for a periodic audit of performance or work procedures and management practices?
- e. Are there standard operating procedures for responding to financial and performance audits to ensure adequate feedback to the budgetary process?
- f. Are there sanctions or remedial procedures for errors detected in the audit?
- g. Do cash balances reconcile with cash in banks and on hand during the audit period?
- h. Does an official maintain a record of all investments, including certificates or serial numbers on official documents?
- i. Does the finance officer periodically take a physical inventory of investment documents and verify the income from such investments?
- j. Are there unfunded liabilities (e.g., pensions)? How are pensions paid?
- k. What costs are not accounted for—municipal land? municipal vehicles?

## ANALYTICAL ISSUES

- Is there a record of previous audit exceptions? What is the magnitude of typical exceptions? How deficient do previous audit reports consider the municipal accounts?

- Do managers respond to the financial feedback in making adjustments to the operational aspects of the authority and vice versa?
- What are the major strengths and weaknesses of the auditing and reporting procedures?
- Are competent accounting staff available?

# 5

## ANALYSIS OF FINANCIAL INDICATORS

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Chapter 4 provided guidance in assessing the financial management of a water authority—through questions that elicit information and data on the processes and systems it employs. This chapter describes the quantitative analysis that can be conducted with the data obtained. It contains the principal financial indicators to assess the financial status of the authority, and provides an interpretation of these indicators.

To conduct the analysis, all financial statements, whether audited or not, should be obtained (for three to five years). Examples of these are an income statement, balance sheet, statement of changes in financial position (cash flow), supporting statements or schedules, and notes to the financial statements.

The fiscal health of an authority is determined by six interrelated elements: income; expenditures; overall operating condition (cash flow); structure of debt; condition of capital facilities; and unfunded liabilities.

For each of these elements, there are simple indicators (Box 4) that are applied to the financial analysis of any revenue-earning organization. They are described in the paragraphs that follow.

### 5.1 Income

The income of an authority will consist primarily of user charges levied as tariffs, connection charges, and other fees. Other sources of revenue could be transfers from government (subsidies) and interest earned on investments. The primary income indicators to be examined are:

- Total income (gross)
- Water sales per connection
- User charge coverage
- Revenue shortfalls
- Proportion of nonrevenue water
- Collection efficiency
- Billing efficiency



#### **Box 4: Indicators of Financial Condition**

1. **Income**
  - Total Income (gross)
  - Revenues (per capita)
  - User Charge Coverage
  - Revenue Shortfalls
  - Collection Efficiency
  - Billing Efficiency
  
2. **Expenditures**
  - Expenditures (total and per connection)
  - Employees (total and per connection)
  - Operating Costs per m<sup>3</sup>
  - Personnel Costs
  - Fixed Costs
  
3. **Overall Operating Condition**
  - Operating Deficits
  - Reserves
  - Cash Flow
  
4. **Debt Structure**
  - Current Liabilities
  - Long-term Debt
  - Debt Service
  
5. **Condition of Capital Facilities**
  - Maintenance Expenditures
  - Capital Expenditures
  - Depreciation
  
6. **Unfunded Liabilities**
  - Deferred Maintenance
  - Pension and Leave

Analyzing trends in these indicators reveals potential deterioration in the revenue base, dependence (or overdependence) on external revenue sources, user fees that do not cover the cost of the service, poor revenue-estimating practices, water distributed but not paid for, and inefficiency in the collection and administration of revenues.

## **5.2 Expenditures**

As indicated in Chapter 2, expenditures reflect both short-term and long-term financial outlays included in the current and capital budgets. Expenditures can exceed both budgeted and actual revenues. Alternatively, as a means of expenditure control, maintenance of capital facilities may be deferred to satisfy short-term operation requirements or to respond to specific emergencies. An authority should have a growth rate in expenditures that does not exceed the growth rate of revenues. Principal expenditure indicators are:

- Expenditures (total and per connection)
- Employees (total and per connection)
- Operating costs per m<sup>3</sup>
- Fixed costs (total and as a proportion of expenditures)
- Personnel costs

Excessive growth in any of these areas may indicate ineffective cost control, increases in fixed costs (and particularly debt service as discussed below), declines in productivity (either of personnel or in plant capacity), and potential growth in programs which could create future expenditure liabilities. (See Report 2 in the WASH Financial Management Series, *Guidelines for Cost Management in Water and Sanitation Institutions*.)

## **5.3 Overall Operating Condition**

An authority's operating condition reflects its ability to generate positive (or at least not negative) net income (revenues less expenses) on a current basis, and maintain reserves for emergencies and sufficient cash to pay its bills in time. Primary indicators include operating deficits, reserves, and cash position.

Net income should be examined carefully to determine whether a deficit is being masked by deferral of capital expenditures to meet current expenses or whether current operating expenses are perhaps being met from reserves or excessive short-term borrowing. An analysis of these indicators could reveal deficits symptomatic of poor revenue forecasting or rate setting, poor collections, poor cost control, or declines in either liquidity or reserves.

## **5.4 Debt Structure**

While borrowing is an effective way to finance capital improvements and occasionally to even out short-term revenue and expenditure fluctuations, the ability to repay is of critical importance. Debt structure is the composition and relationship of debt to the overall financial structure of the authority.

Short-term debt (less than one year), as indicated above, may be used to even out cash flows if the authority is legally empowered to borrow for the short term. If there are revenue shortfalls or overexpenditures, an authority may be unable to repay the short-term loan and so may reborrow the money. This "rolling over" of the debt, by paying for the original loan with a new one, turns short-term debt into long-term debt. If this practice continues over a number of years and the amount of debt increases, it could be an indication that the debt is being used to finance operating deficits and should be a cause for concern. While short-term borrowing has definite advantages, using short-term vehicles as a long-term borrowing device can be quite expensive as short-term interest rates often are higher.

Long-term debt generally is used for capital projects. It should not extend beyond the useful life of the plant or facilities it finances, should not be used to balance the operating budget, and should not require repayment schedules that would adversely affect the current budget.

Indicators of debt structure which should be examined are the composition of current liabilities, the composition of long-term debt, and debt service (principal and interest to be repaid annually). In addition, several important ratios help to analyze the potential effects of debt on the fiscal condition of the authority (see Box 6).

## **5.5 Condition of Capital Facilities**

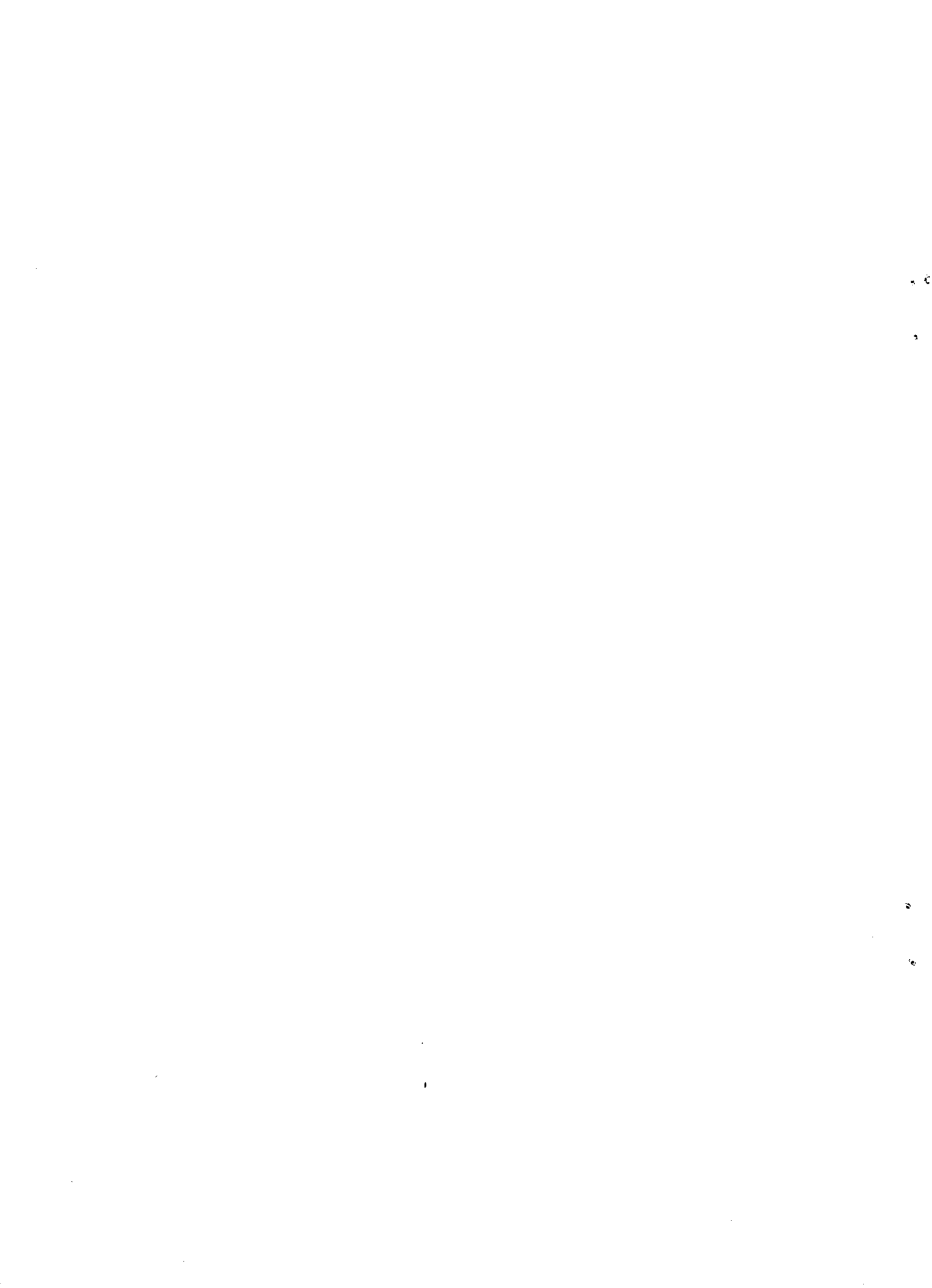
The condition of capital facilities—buildings, plant, and equipment—is critical to the successful functioning of an authority. To monitor the condition of these fixed assets, the authority ideally should have a comprehensive fixed asset inventory or ledger. Even if such a ledger is not maintained, cost records of repair and maintenance should be kept. The principal indicators of the condition of capital facilities are maintenance expenditures, capital expenditures, and depreciation.

Poorly maintained fixed assets are not only less useful but also more costly in the long run because of the expense of future replacement and, therefore, could result in a large unfunded liability. Unfortunately, maintenance is one of the most neglected aspects of an authority's operations because cutting down on maintenance is one of the simplest ways to reduce current expenditures. The importance of maintenance is becoming increasingly evident, however (see WASH Technical Report No. 35, *Assessment of the Operations and Maintenance Component of Water Supply Projects*).

## **5.6            Unfunded Liabilities**

Unfunded liabilities are those for which no funds have been set aside. They are important to identify because they are not shown in the financial statements and can accumulate over time.

Indicators of unfunded liabilities are the value of deferred maintenance, and, if relevant, the value of unfunded pension liability, pension assets, and accumulated employee leave liability. The most pertinent example of such unfunded liabilities in water authorities is deferred maintenance for which no provisions have been made. If this type of obligation is allowed to grow, it can have a serious adverse effect on the authority's fiscal condition. Reserves may be severely depleted or large borrowing may result.



# 6

## FINANCIAL RATIOS

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Three major types of financial ratios (Box 5) that measure profitability, short-term liquidity, and long-term solvency define the overall fiscal condition of an authority.

### Box 5: Key Financial and Service Ratios

Profitability		
Rate of Return on Assets (ROA)	=	$\frac{\text{Net Income Before Interest}}{\text{Average Total Assets}}$
Profit Margin Ratio	=	$\frac{\text{Net Income}}{\text{Operating Revenue}}$
Assets Turnover Ratio	=	$\frac{\text{Total Sales}}{\text{Average Total Assets}}$
Accounts Receivable Turnover Ratio	=	$\frac{\text{Net Sales on Account}}{\text{Average Accounts Receivable}}$
Short-term Liquidity		
Current Ratio	=	$\frac{\text{Total Current Assets}}{\text{Total Current Liabilities}}$
Quick Ratio	=	$\frac{\text{Total Liquid Assets}}{\text{Total Current Liabilities}}$
Long-term Solvency		
Debt-Service Ratio	=	$\frac{\text{Net Income Before Interest and Depreciation}}{\text{Total Debt Service}}$
Long-term Debt Ratio	=	$\frac{\text{Total Noncurrent Liabilities}}{\text{Noncurrent Liabilities and Equity}}$
Debt-Equity Ratio	=	$\frac{\text{Total Liabilities}}{\text{Liabilities and Equity}}$
Service Coverage	=	Percentage of Population Served with Water Supply
Unaccounted for Water	=	$\frac{\text{Total Produced} - \text{Total Billed}}{\text{Total Produced}}$

Because the ratios are based on data obtained from financial statements, they are subject to the limitations of these statements, especially those resulting from variations in accounting methods that permit different definitions of assets and liabilities. Definitions of all accounting terms used in the analysis should be part of the assessment; for example, the use of acquisition cost rather than current replacement cost or net realizable value should be made clear. It is important that the user of these ratios be reasonably conversant with the language of financial statements and the principles of accounting.

## **6.1 Measures of Profitability**

**Rate of Return on Assets (ROA)**. The ROA is the most important profitability measure for assessing management's performance in using assets to generate earnings. It is the ratio of net income (before interest expense) to average total assets, and should be positive.

**Profit Margin Ratio**. This measure, which is simply net income divided by operating revenue, is sometimes called the net income ratio. It measures the authority's ability to control the level of costs or expenses relative to revenues generated. Increases in the measure could reflect decreases in operating expenses, or increases in economies of scale. The components of net income should be examined to interpret trends in this measure by looking at the indicators included in the discussion of overall operating condition in Section 5.3. Profit margin is a significant contributor to the ROA.

**Assets Turnover Ratio**. Calculated as the ratio of total sales to average total assets, the assets turnover ratio is the second major contribution to the ROA. A major component of the assets turnover ratio is the turnover in accounts receivable. For water authorities, sales on account are the single largest asset that can be manipulated.

**Accounts Receivable Turnover Ratio**. This is the ratio of net sales on account to average accounts receivable. It is often expressed in terms of the average number of days receivables are outstanding before cash is collected. Thus, the rate at which accounts receivable turn over gives an indication of their nearness to being converted to cash. Deviations from collections policies can also be detected using this measure. If the average number of days receivables are outstanding is greater than what the authority's policy allows for collections due, a warning flag should be raised. Perhaps a more aggressive collection policy is in order.

## **6.2 Measures of Short-term Solvency (Liquidity)**

**Current Ratio** is the ratio of total current assets to total current liabilities and is presumed to indicate the ability of the authority to meet its current obligations. It is of particular interest to short-term creditors. The current ratio should remain higher than one, reflecting an excess of assets over liabilities. Caution should be used in interpreting this ratio to make

certain that a high rate of current assets does not reflect "window dressing" by management. For example, toward the end of a fiscal year, purchases on account may be delayed to enhance the current liability position on the current balance sheet. In some cases, it could reflect a build-up of inventories, or more likely a high level of accounts receivable. Therefore, increases in the current ratio should be examined carefully.

Quick Ratio. The quick ratio or so-called "acid test ratio" is a variation of the current ratio. It considers only those current assets that can be quickly converted into cash and excludes stock inventories. Accounts receivable may or may not be included, depending on a judgment of whether these accounts are likely to be written off. This measure should have a value greater than one.

### **6.3 Measures of Long-term Solvency (Debt Ratios)**

Debt-Service Ratio. The debt service ratio is calculated by dividing net income (before depreciation and interest) by total debt service. It is a simple measure of the proportion of net income that goes to servicing debt. It should remain much less than one. Debt service can be a significant contributor to high fixed costs.

Long-term Debt Ratio. This ratio reports the portion of the authority's long-term capital that is furnished by debt holders. It is calculated by dividing total noncurrent liabilities by the sum of total noncurrent liabilities and total equity.

Debt-Equity Ratio is the ratio of total liabilities (current and noncurrent) to the sum of total liabilities and total shareholders' equity. As such, it will generally be higher than the long-term debt ratio, particularly if long-term debt is a relatively high proportion of total liabilities.

In general, the higher these ratios, the higher the likelihood that the authority may be unable to meet fixed interest and principal payments in the future. The decision most authorities face is how much debt they can afford to assume. Funds obtained by issuing bonds or by borrowing have a relatively low interest cost but may require fixed, periodic payments that increase the likelihood of bankruptcy.

In assessing the debt ratios, the standard varies in direct relation to the stability of earnings. The more stable the earnings, the higher the debt ratio considered acceptable or safe. The debt ratios of public utilities are customarily high, frequently of the order of 60 percent to 70 percent. The general stability of public utility earnings makes these ratios more acceptable to analysts (and investors) who would be dissatisfied with such large leverage for firms with less stable earnings.



## **6.4 Measures of Service and Operation**

Service Coverage. The percentage of total population served by the authority's water services gives perspective and context to the authority's operations. For example, a financially successful authority serving only 25 percent of the total population may have a different set of financial priorities from an authority required to provide service coverage to 80 percent of the population.

Unaccounted for Water (UFW). The higher the proportion of billed water production to total production, the lower the amount of UFW. Some authorities have high ratios of UFW, i.e., .45 to .60. An acceptable level of UFW is 20 percent of total production (ratio of .20).

## **6.5 Trend Analysis**

The ratios and indicators described above are standard to any analysis of fiscal condition. They have little meaning in isolation from each other or when viewed at a single point in time. It is important that the analyst consider the financial management practices of the authority as a whole, examining them as they relate to each other for the current year and over time.

Trend analysis can identify changes in financial performance, and can also be used effectively during data collection to elicit more accurate and detailed information about the authority's operations. The assessment team can assemble data on key financial indicators and perform simple trend analyses with the authority staff to uncover patterns in financial performance. Box 6 lists key financial indicators developed from the Indonesian field test that can be used most effectively in charting financial performance and for which the data were readily available. The indicators are a generic set of "quick and simple" indicators that can be used to produce a generalized overview of the financial performance of an authority. Although developed in the Indonesia case study, they are generally applicable in any country setting. This set of indicators can also be used to measure performance differences across a group of local water authorities.

### **Box 6: Quick Financial Indicators and Ratios**

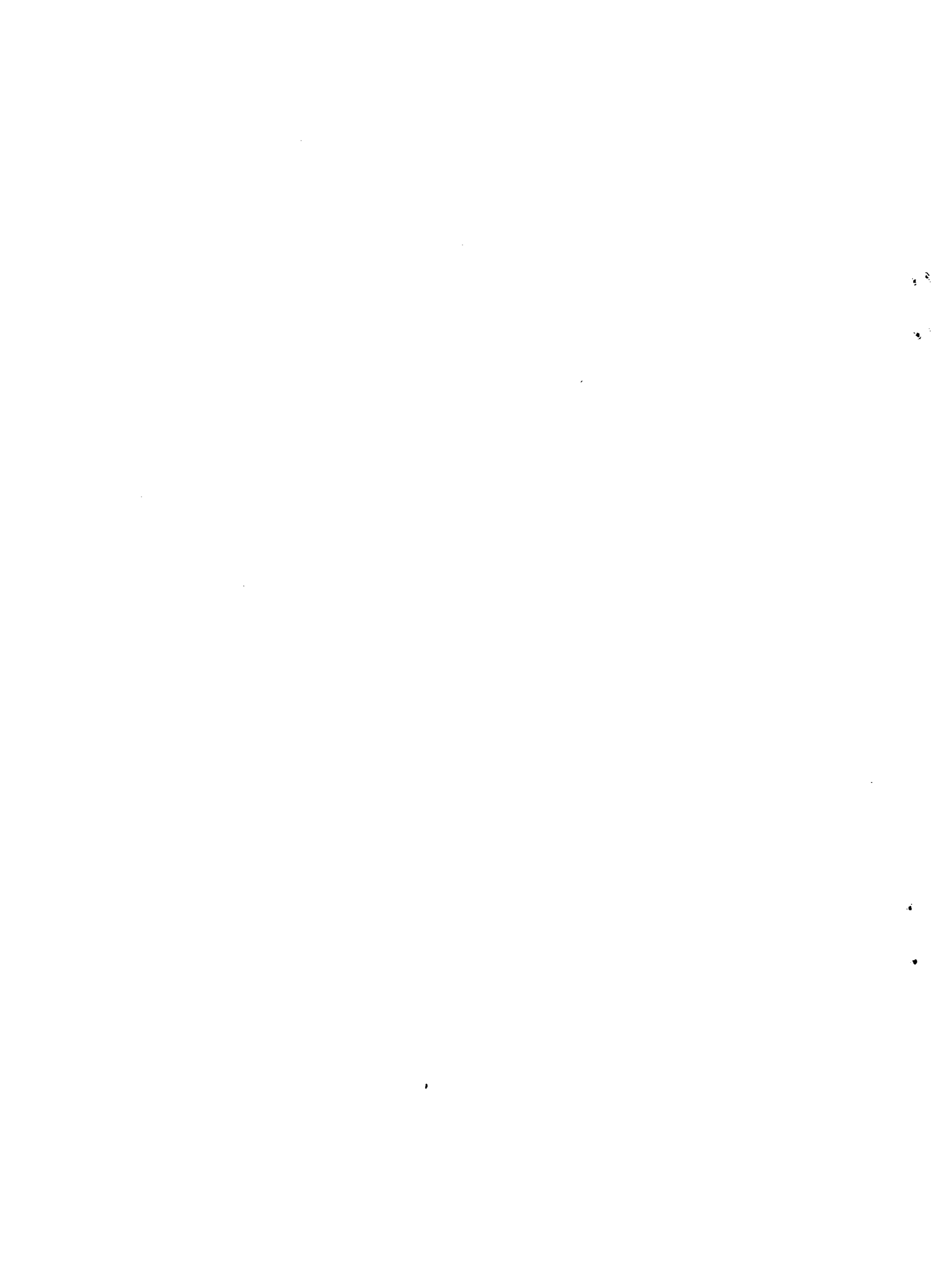
1. Service Coverage
2. Sales per Connection
3. Operating Costs per m<sup>3</sup>
4. Employees per 1000 Connections
5. Personnel Costs/Operating Costs
6. Operating Costs/Operating Revenue (Working Ratio)
7. Percentage of Unaccounted for Water or Non-Revenue Water
8. Annual Collection Efficiency; Annual Collections as a Percentage of Billings
9. Monthly Collection Efficiency; Percentage of Accounts Receivable over 30 Days
10. Debt Service as a Percentage of Total Operating Revenue
11. Debt Service Ratio
12. Profit Margin Ratio

Schedule 1 furnishes a more comprehensive format for examining the various indicators and ratios, and permits the analyst to make an assessment of the overall financial condition. Several years of data should be collected for each indicator, if possible, and any changes in practices, policies, or definitions during those years that may make the data incomparable should be noted. Growth rates should be calculated and examined for the direction and stability of the trends, which should be interpreted in light of the analyst's knowledge of finance and the guidance provided in this and prior chapters. A graphical presentation of these time series data is also recommended.

ANALYSIS WORKSHEET

Financial Element/Indicator	YEAR					AVERAGE GROWTH RATE	TREND	NOTES/COMMENTS
	19__	19__	19__	19__	19__			
<b>Income</b>								
1. Total Income (gross)	_____	_____	_____	_____	_____	_____		_____
2. Revenues per Capita	_____	_____	_____	_____	_____	_____		_____
3. User Charge Coverage	_____	_____	_____	_____	_____	_____		_____
4. Revenue Shortfalls	_____	_____	_____	_____	_____	_____		_____
5. Collection Efficiency	_____	_____	_____	_____	_____	_____		_____
6. Billing Efficiency	_____	_____	_____	_____	_____	_____		_____
<b>Expenditures</b>								
1. Expenditures	_____	_____	_____	_____	_____	_____		_____
2. Employees	_____	_____	_____	_____	_____	_____		_____
3. Fixed Costs	_____	_____	_____	_____	_____	_____		_____
<b>Overall Operating Condition</b>								
1. Operating Deficits	_____	_____	_____	_____	_____	_____		_____
2. Reserves	_____	_____	_____	_____	_____	_____		_____
3. Cash Position	_____	_____	_____	_____	_____	_____		_____
<b>Debt Structure</b>								
1. Current Liabilities	_____	_____	_____	_____	_____	_____		_____
2. Long-term Debt	_____	_____	_____	_____	_____	_____		_____
3. Debt Service	_____	_____	_____	_____	_____	_____		_____
<b>Condition of Capital Facilities</b>								
1. Maintenance Expenditures	_____	_____	_____	_____	_____	_____		_____
2. Capital Expenditures	_____	_____	_____	_____	_____	_____		_____
3. Depreciation	_____	_____	_____	_____	_____	_____		_____

Financial Element/Indicator	YEAR					AVERAGE GROWTH RATE	TREND	NOTES/COMMENTS
	19__	19__	19__	19__	19__			
	1	2	3	4	5			
<b>Unfunded Liabilities</b>								
1. Deferred Maintenance								
2. Pension and Leave								
<b>Profitability</b>								
1. Rate of Return on Assets								
2. Profit Margin Ratio								
3. Assets Turnover Ratio								
4. Accounts Receivable Turnover								
5. Plant Asset Turnover								
<b>Short-term Liquidity</b>								
1. Current Ratio								
2. Quick Ratio								
<b>Long-term Solvency</b>								
1. Debt-service Ratio								
2. Long-term Debt Ratio								
3. Debt-equity Ratio								



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## **APPENDIX A**

### **Instructive Lessons from the Field Test in Indonesia of the GUIDELINES FOR CONDUCTING A FINANCIAL MANAGEMENT ASSESSMENT OF WATER AUTHORITIES**



## APPENDIX A

### Instructive Lessons from the Field Test in Indonesia of the GUIDELINES FOR CONDUCTING A FINANCIAL MANAGEMENT ASSESSMENT OF WATER AUTHORITIES

WASH Field Report No. 289, "Application of the WASH Financial Management Guidelines to Indonesia's Autonomous Water Supply Enterprises," describes a field test of the guidelines conducted by WASH in December 1989. The application of the guidelines in a specific country will vary with local conditions; the most important requirement is the availability of good financial time series data.

The Indonesian field test used a group interview, the method chosen by the director of the authority. About 25 people representing heads of departments and other staff important to the assessment were assembled in the director's office for an explanation of the purpose of the assessment. Following this, various topics were introduced by turn, and personnel stayed or left depending on their interests and ability to contribute. This process lasted through three half-day sessions. Part of this time was taken up with observation of the treatment works, computerized billing procedures, and other parts of the authority the director decided were necessary for the team to see. In the final information gathering session, individual consultants addressed specific department heads or individuals on topics that had not been addressed in the general sessions, for example, procurement and cash management. At all times the WASH team was guided by the question and answer data collection format set out in Chapter 4 of the guidelines.

Though the consultants had access to some financial sources, the most useful and revealing data were collected in the group sessions. A "white board" was used to develop time series data for production, revenue, and costs, and although this group exercise at times was slow as participants provided data, the results were of great interest to the group. It became apparent, for example, that billed production as a percentage of total production was decreasing. Various explanations, both technical and managerial, were given for this. But the fact that the volume of unaccounted for water, or nonrevenue water, was rising was made obvious. Box 7 sets out the type of information grid that was developed for Indonesia.

**Box 7: Production, Revenue, and Cost Analysis (Current Prices)**

	UNIT
<b>PRODUCTION</b>	
Total Production	m <sup>3</sup> million
Billed Production	m <sup>3</sup> million
Unaccounted for Water (UFW)	m <sup>3</sup> million
UFW as Percent of Total	%
<b>REVENUE</b>	
Billed Production	Rps million
Water Sales	Rps million
Collection Efficiency	%
Other Operational Revenue	Rps million
Non-Operational Revenue	Rps million
Total Revenue	Rps million
Annual Growth in Water Sales	%
Annual Growth in Total Revenue	%
<b>COSTS</b>	
	Rps million
Operational	Rps million
Non-operational	Rps million
Total Costs	Rps million
<b>NET SURPLUS</b>	
	Rps million
<b>STAFF</b>	
	Number
<b>CONNECTIONS</b>	
	Number
TOTAL REVENUE PER CONNECTION	Rps thousand
WATER SALES PER CONNECTION	Rps thousand
OP COSTS PER CONNECTION	Rps thousand
INCREASE IN CONNECTIONS	%
GROWTH IN RATE IN CONNECTIONS	%
GROWTH IN RATE WATER SALES PER CONNECTION	%
GROWTH IN RATE IN OP COSTS PER CONNECTION	%
WATER SALES PER m <sup>3</sup> (Total Production)	Rps/m <sup>3</sup>
WATER SALES PER m <sup>3</sup> (Billed Production)	Rps/m <sup>3</sup>

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## THE WASH PROJECT

With the launching of the United Nations International Drinking Water Supply and Sanitation Decade in 1979, the United States Agency for International Development (A.I.D.) decided to augment and streamline its technical assistance capability in water and sanitation and in 1980, funded the Water and Sanitation for Health Project (WASH). The funding mechanism was a multi-year, multi-million dollar contract, secured through competitive bidding. The first WASH contract was awarded to a consortium of organizations headed by Camp Dresser & McKee International Inc. (CDM), an international consulting firm specializing in environmental engineering services. Through two other bid proceedings since then, CDM has continued as the prime contractor.

Working under the close direction of A.I.D.'s Bureau for Science and Technology, Office of Health, the WASH Project provides technical assistance to A.I.D. missions or bureaus, other U.S. agencies (such as the Peace Corps), host governments, and non-government organizations to provide a wide range of technical assistance that includes the design, implementation, and evaluation of water and sanitation projects, to troubleshoot on-going projects, and to assist in disaster relief operations. WASH technical assistance is multi-disciplinary, drawing on experts in public health, training, financing, epidemiology, anthropology, management, engineering, community organization, environmental protection, and other subspecialties.

The WASH Information Center serves as a clearinghouse in water and sanitation, providing networking on guinea worm disease, rainwater harvesting, and peri-urban issues as well as technical information backstopping for most WASH assignments.

The WASH Project issues about thirty or forty reports a year. *WASH Field Reports* relate to specific assignments in specific countries; they articulate the findings of the consultancy. The more widely applicable *Technical Reports* consist of guidelines or "how-to" manuals on topics such as pump selection, detailed training workshop designs, and state-of-the-art information on finance, community organization, and many other topics of vital interest to the water and sanitation sector. In addition, WASH occasionally publishes special reports to synthesize the lessons it has learned from its wide field experience.

For more information about the WASH Project or to request a WASH report, contact the WASH Operations Center at the above address.