DISCUSSION PAPER

FINANCIAL APPRAISAL STRATEGY FOR
WATER SUPPLY AND SANITATION PROJECTS:
GUIDANCE FOR FINANCIAL INTERMEDIARIES

by

David C. Jones

April 1986

Water Supply and Urban Development Department
Operations Policy Staff
The World Bank

The views presented herein are those of the author(s), and they should not be interpreted as reflecting those of the World Bank.
Acknowledgments

David C. Jones is financial advisor for Water Supply and Urban Development at the World Bank. His entire career has been spent in various aspects of water supply, sanitation, and urban financial management in the United Kingdom, in developing countries, and at the Bank.

Mr. Daniel P. Coyaud and Mr. Lars A. V. Rasmusson contributed to the preparation of this paper.
CONTENTS

Introduction ........................................................................ 1
Sector Policy ........................................................................ 1
Management Structure ......................................................... 2
Economic Analysis .................................................................. 2
Capital Financing .................................................................... 3
Pricing Policies ........................................................................ 4
Sewerage Charges ................................................................... 5
Accounting and Costing .......................................................... 6
FINANCIAL APPRAISAL STRATEGY

FOR

WATER SUPPLY & SANITATION

Guidance for Financial Intermediaries

Introduction

In the past, much emphasis has been placed by borrowers, lenders and project approval entities on the technical design and implementation of water and sanitation projects. Financial considerations have often been confined to the provision (or availability) of funds for project construction. However, continued emphasis on technical matters will prove increasingly frustrating and futile, unless much greater attention is concurrently given to policy, management, economic and financial considerations. In particular, sector institutions will have to face up to much harsher financial and economic realities than have hitherto prevailed.

The relative reluctance to stray too far from technical considerations is, to an extent, understandable. Many of the senior officials of sector institutions are technical specialists, who feel more comfortable with these matters. However, there is often a deep-seated reluctance to expose the institutional, economic and financial matters to too close a scrutiny because of a genuine fear of what this would reveal. Indeed, the prospects are potentially quite frightening and time should not be lost in coming to grips with them. Managing a development program within resource constraints is vastly different from preparing hopeful lists of projects and then searching around for the necessary finance.

Sector Policy

In many countries, immediate demands for the solution of water and sanitation problems already far outstrip the institutional, human and financial resources available. Thus, there is often an urgent need is to set up and develop national procedures for the establishment of sector policy. This need not, and should not, conflict with the possible wish or requirement to decentralize operations to local entities and institutions. However, policies must be established to define levels of responsibility and to clearly allocate resources.

In particular, it would seem appropriate to separate the project construction process from its financing. Quite often, capital investment is undertaken by a government department (e.g. a Ministry of Works) or by an urban development authority, with open-ended access to government funding. Project facilities are only then handed over to local entities for operation and maintenance. Instead, project construction should increasingly become more closely integrated with operation and maintenance - all under the control of the same institution at local level. This would not preclude delegation of
part of the tasks to public utility institutions and to the private sector. Then, if project financing were to be made available, as it eventually must be, in much more economically realistic terms than at present, service delivery institutions will be forced into more rational choices regarding their operating and investment priorities. In particular, they may find greater incentives towards rehabilitation, improved operation, the dampening of demand by economic pricing policies and reduction of unaccounted-for water, as more attractive alternatives to unconstrained capital investment.

Management Structure

At the present time, water and sewerage operations are often mixed up with other general municipal services. Although their revenue-earning potential is recognized, the potential revenues are often seen merely as making a contribution to the general pool of municipal revenues. Sometimes the charges are related to financial and economic logic - often less so. Experience tends to show that water and sanitation services can and should be largely self-supporting, financially. There are a variety of ways in which this can be attempted and often achieved. Consideration should be given to the establishment of these services under quasi-autonomous management structures which recognize their special service characteristics. They should, in principle, be required to be financially self-supporting, whilst maintaining links with the appropriate municipalities. What must not happen, is that they develop into a "most-favored-service" with no longer an acceptable degree of public accountability. In particular, prioritization of investment and the allocation of capital funding should take place within the context of overall infrastructure planning for the area or region as a whole.

The establishment of water and sanitation operations on a more self-sufficient basis will have both positive and negative implications for municipal financial management. A most important positive aspect will be to remove the costs of water and sanitation services from the responsibility of the general taxpayer. Instead, they will be increasingly paid for by users. This will free up local tax revenues for the municipalities to use on other urgent and important services.

A possible temporary disadvantage of separating water and sanitation services will be the need for municipalities to adjust their systems of political and administrative control over all services. Budgets will need to be restructured, tax and charging policies changed and management systems revamped. In particular, better accounting and financial reporting systems will be needed to identify and ascertain costs of services to be financed from different revenue sources. Indeed, one possible viable choice is to run water and sanitation operations as a self-accounting activity but under the overall general management of the municipality.

Economic Analysis

The past emphasis upon technical matters has tended to obscure, as already stated, the important underlying economic constraints. The fact that there can no longer be unconstrained construction of new facilities
illustrates the need for careful and thorough economic analysis of every proposed project. Put very simply, the aim should be to maximize the output from existing facilities, to postpone new facilities for as long as possible and then to ensure that the new capital investment represents the least economic cost of feasibly meeting current and future demands on the system.

Experience seems to demonstrate that forecasts of demand are often excessive, leading to over-investment which can be ill-afforded with limited resources. This is hardly surprising, because in many situations, capital costs of fixed assets are often not recovered. Depreciation often does not include civil works, networks and plants, where these have been constructed and handed over by another institution. Consequently consumers are not being asked to pay full costs of services, thus creating a likely situation of over-demand, merely because of low prices. When this is coupled with less than adequate forecasting techniques, compensated for by wider safety margins, the results can be costly, especially to the public general taxpayer.

Techniques of engineering economics are well known. Their application should be refined and reemphasized in the design and development of new facilities. This should be complemented by thorough economic and financial analysis, both of the project and the project entity.

Capital Financing

The financing of much water and sanitation investment has often been highly subsidized, using low interest loans or a mixture of financing which relies heavily upon grants. Whilst these methods may have proven useful for the implementation of government policies, they have also encouraged municipalities and other institutions to undertake investments, perhaps too soon and too large, about which they would have more serious misgivings if faced with the full economic costs of their capital financing.

There can be little objection to the use of some proportion of grant financing for capital purposes if it is to be used to capitalize the operations of the water and sanitation institution. However, where this is done, good financial practice would demand that a return be earned on all of the institution's assets, however financed. In this way, returns on the capitalization could be used as internal funds for future capital investment. In practice, this appears often not to be the case. Instead, grant financing has often been used to permit the continuance of sub-optimal tariffs, creating a double bind for the institutions. On the one hand, lower tariffs have encouraged increased demand - on the other, they have created no internal funds to make even small contributions to the development of systems to meet the new demands.

Much experience, in many parts of the world, has demonstrated that water and sanitation systems can be financially viable from consumer revenues, even where capital must be raised or borrowed wholly on commercial terms.

1/ "Financial Appraisal of Public Infrastructure Projects and Implementing Institutions" (Discussion Paper UDD-95).
addition, where services are provided by private companies, taxes on profits are sometimes collected by Governments. It would thus seem appropriate, therefore, to move towards at least three principles in financing new capital expenditure:

(a) recognize that sound pricing policies will tend to increase the proportion of new investment which can be financed from internal funds;
(b) provide the majority of external financing by loans on fully commercial terms; and
(c) where grants are used to finance capital investment, use procedures to ensure that these are used to capitalize the institution, rather than subsidizing the tariffs.

Pricing Policies

Much reference has been made in many places to the fact that water supply is a so-called "basic need" with the strong implication that, for this reason, its provision should be subsidized. The self-evident result of such a policy is that, for those who are fortunate enough to have a water supply and/or sanitation service, their costs will be paid for partly by those who have no service. Furthermore, the prospects of the latter being served at all are seriously diminished when subsidized tariffs, for the fortunate few, create a shortage of funds to serve everyone else.

Once again, experience has demonstrated the financial viability of serving every kind of consumer, rich and poor alike, if suitable tariff structures and levels are in place. Indeed, the basic needs of all can easily be provided by an affordable, albeit sub-optimal, pricing system, so long as the majority of water, which is not a basic need is supplied at prices which are economic. In principle, unit prices should match, or approach, average incremental costs. Whilst this may be susceptible to legitimate criticisms of detail, the fact remains that a private water company would not normally make a new investment in system expansion unless its expected additional revenues exceeded its expected additional costs, both discounted at its current cost of capital - be it debt or equity.

The arguments against incremental cost pricing are more valid in developed countries such as those of Western Europe and USA, whose systems are giving virtually universal coverage, with a relatively low demand for new capital investment. In developing countries, by contrast, the need to conserve capital resources, physical and financial, suggests that incremental cost pricing would be a useful tool in both controlling and postponing demand and also for generating internal funds for capital investment.

Financial, as well as economic, considerations must also be taken into account. It is axiomatic that no financially-autonomous water supply and sanitation institution can remain viable over the long term unless its revenues cover fully the costs of operation, maintenance, full depreciation of fixed assets and a reasonable return on its total fixed assets and working capital. Depending on its capital structure, an organization which meets
these objectives should be able to provide a significant proportion of its future investment requirements from internal funds, after meeting debt service.

In most situations, water and sanitation investments will result in ever-increasing incremental unit costs. This is bound to be so if the cheaper sources of supply are exploited first. Because of the large unsatisfied demand, this situation suggests that the greater use of incremental cost pricing would normally provide coverage of financial objectives, with adequate margins of safety. This is because financial results are based on average historical costs as compared to incremental future costs. The fact that many water and sanitation systems do not even pay their way on a financial basis is, therefore, a strong indication that services are seriously under-priced from an economic viewpoint.

The finances of water and sanitation services are often closely combined with those of municipalities. Then, sometimes, municipalities have, to keep down prices or to minimize demands on budgetary resources, eliminated depreciation provisions from pricing calculations. This is fundamentally wrong in principle and inconsistent with sound financial practices. Indeed, even the inclusion of full depreciation will not be adequate unless fixed assets are revalued to keep pace with inflation.

One point to be stressed is that water and sanitation systems are highly capital-intensive. Thus, the mere coverage of operation and maintenance costs usually goes only a small way towards the full cost recovery necessary to sustain, to replicate and to expand the systems and services.

**Sewerage Charges**

Much more attention has often been given to direct charging for water systems than for sewer systems. Most of the costs of the latter have been, until now, a charge upon general municipal revenues. It is becoming increasingly recognized, however, that sewage treatment and disposal is an integral part of the water use cycle and that most, if not all, of the costs should fall upon water users (and water polluters).

An important and feasible way to charge for sewerage services is to add a surcharge to the water bill. The fact must be faced that when sewer systems are more fully developed their potentially higher treatment costs and the newer systems in more costly current prices, may require sewer surcharges which will be higher than the water charges to which they relate. This could create consumer resistance to a full use of direct charges. Some degree of justification for more indirect charging systems can perhaps be derived from local, national and international environmental concerns. There is a strong danger, however, that these concerns can be over-emphasized and used as an excuse to reduce the charges to primary polluters, on whom they should most legitimately fall.

Thus, for industrial and commercial wastes, it will be necessary to develop situation-specific charging policies, coupled with regulatory requirements for polluting institutions to recycle or control their own wastes and for the gradual prohibition of toxics, corrosives and inhibitors from entering the public sewers at all.
Sound financial management of water and sanitation systems, including pricing policies, must be based upon the production of adequate and well analyzed data from financial information systems. These must be concerned with both accountability and management. Thus, emphasis must be on integrated systems of historical accounting, costing and budgeting.

At present, many municipal accounting systems are too simplistic to provide the necessary information for many of the important management and operational decisions already referred to. This is particularly true with reference to fixed assets, the costing for which represents an important input to pricing policies.

Thus, it seems clear that there is an urgent need to review and, if necessary, overhaul accounting systems currently in use so that these can become more meaningful to the financial management process. This applies as much to the management of general municipal services as it does to water and sanitation systems.