Private Sector Participation in Urban Water Services in sub-Saharan Africa: The Way Out for Efficient Service Delivery

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Introduction

- Infrastructure forms the sinews of development. Efficient and adequate water supply, underpin a competitive economy and improve peoples’ health.

- Services such as water and sanitation often called “hard infrastructure” are vital for economic growth and contribute directly to poverty reduction (DBSA [1]).

- No region in the world is in greater need of new investment and more efficient operation of its infrastructure than sub-Saharan Africa.
Introduction

- Sub-Saharan Africa lags behind the rest of the world harnessing the benefits of private participation in infrastructure, especially in the water and waste sectors.
- Of 1,161 private infrastructure projects concluded since 1984, sub-Saharan Africa has seen only 80 or about 7% (Kerf and Smith [2]).
- The almost universally poor quality of the regions infrastructure directly impacts on the living standards of its people and constrains private investment in other activities.
- The public sector remains the dominant force in Nigeria’s economic life, and has largely contributed to inefficient development since the early 1980’s (African Review [3]).
Introduction

- By 1986, the estimated number of public enterprises in Nigeria was 1,500 out of which 600 were under the Federal Government, and the rest owned by state and local governments (Obadan [4]).
- This accounts for about 67% of the Gross Domestic Product (African Review [3]) and over 60% of modern sector employment (FRN [5]). Annually, the state monopolies cost over U.S $2 billion in subsidies alone.
- In the drinking water supply sector, over 1000 urban and semi-urban water supply schemes existed by 1990, which were all in poor condition and were deteriorating rapidly.
Introduction

- The various state water agencies responsible for the provision of water supply services were at the lower level of development, characterized by poor funding and organization, under passive and inadequate legal framework, and operating with little or no visible operational guidelines (FMWRD [6]).

- The effect was the fast decline of urban/semi-urban water supply delivery, which if not arrested was heading to an unacceptable level of about 8 litres per capita per day. The WHO/UNICEF Water Supply and Sanitation Sector Monitoring Reports for water supply coverage for Nigeria as 39%.
Introduction

• By the late 1970’s, the public enterprises accounted for one-third of all international borrowing by developing countries. This became a major source of concern for the principal international lending agencies.

• The World Bank thus came to see privatization as an important policy instrument for reducing the drag of public enterprises on national budgets.

• This became evident in the bank’s lending conditionality in the later part of the 1980’s (World Bank [7]).
Introduction

• Like most other sub-Saharan African countries, Nigeria adopted the policy of privatization in 1986 as an integral part of a larger reform Structural Adjustment Programme (SAP) propagated by the World Bank and the International Monetary Fund (IMF) as a set of conditionalities for external debt relief.

• In this connection, the Government established a technical committee for Privatization and Commercialization in 1988 and launched a formal privatization and commercialization programme of state owned enterprises.
Introduction

• However, because these privatized enterprises are mainly federal operations engaged in production, most infrastructure agencies and all state-owned enterprises such as water authorities have been excluded (FRN [8]).

• Hence, the privatization of its water supply sector is still at the formative stage. Public-private partnerships offer much potential in Nigeria.

• Hence the study is timely and imperative as an immediate solution to increase operational efficiency and achieve institutional strengthening in its water supply services.
Justification for the Privatisation of Water Supply in Nigeria

- Many infrastructure services have been regarded as natural monopolies with economies of scale and high sunk capital costs.
- The public perception had previously been that such services should be provided by the government.
- It is now becoming recognised, however, that many services can be improved and expanded by exposing them to competition through private sector participation (FRN [8]).
Justification for the Privatisation of Water Supply in Nigeria

• Moreover, many services are extensively deteriorated, and their capacity is underutilised because of poor maintenance and lack of funds for operation, causing low operational efficiency and high service costs. The traditional approach to budgetary transfers has not solved these problems (FRN [8]).

• The inability of state water authorities to generate sufficient revenues has contributed to large financial deficits. This has left most state water authorities dependent on subventions from state governments to operate and maintain their water systems, service debt obligations, and finance new investment.
Justification for the Privatisation of Water Supply in Nigeria

• The private sector participation in marketing of water in Nigeria has now become a major phenomenon.

• Recently, there has been a notable increase in the number of bottled and other forms of packaged water called “pure water” being sold on the streets in Nigeria. It costs about 5 cents per unit of 500 ml and it is available throughout Nigeria.

• There is a proven willingness-to-pay by the poor for real services. The poor often pay a high price for a service of bad quality provided by informal vendors.
Justification for the Privatisation of Water Supply in Nigeria

- Oyelade and Duncan [9] undertook a study to ascertain the bacteriological quality and the potential health risk of drinking packaged water on sale in the Lagos metropolis, Nigeria.

- They reported that almost 90% of the sixty (60) samples analysed had coliform count well above the maximum of 10 per 100mLs recommended by the international standards for drinking water quality (WHO [10]).

- The study also revealed that twelve of the sixty samples analysed came from government licensed factories and seven of them had faecal coliform.
Justification for the Privatisation of Water Supply in Nigeria

• Faecal coliform were present in a total of thirty-eight (38) samples. Confirmatory tests show that they are enteric pathogenic bacteria. The study further shows that most people in the Lagos metropolis, Nigeria, regardless of their tribe social class or occupation consume packaged water.

• Most consumers are aware of the characteristics of potable water and the potential health risks associated with the consumption of unhygienic water. Although most consumers consider tap water to be of good quality, they nevertheless take packaged water because coupled with its perceived potability, it is readily available and largely affordable.
Justification for the Privatisation of Water Supply in Nigeria

• A profound change is required in the concept of water supply as a service industry. State water authorities need to operate in accordance with commercial principles.

• The specific benefits of water supply privatization follow from the fundamental change in institutional relationship. Those benefits include increased efficiency in investment, management and operation.

• Moreover, the introduction of private sector managements would benefit the Nigerian economy by both reducing budgetary transfers to public agencies and government budget deficits, and by making more efficient use of scarce resources.
Review of Privatisation Models for Water Supply in Nigeria

- Private sector participation has eight main options, which vary in the degree of involvement of the private sector, the risk for both the public and the public sector, the private operator’s autonomy and responsibility, the required capital investment, the duration of the contract and the contractual relationship with the consumer.

- The private sector participation options can be grouped into two distinct categories. In the first group, the ownership of the assets remain with the government or the public sector, whereas in the second group, partial or full ownership is transferred (permanently or temporarily) to the private sector.
Review of Privatisation Models for Water Supply in Nigeria

• The first group -public ownership- includes:
  • Service Contracts, Management Contracts, Lease Contracts and Concession Contracts.

• The second group –at least partial private ownership- includes:
  • BOOT (Build-Own-Operate-Transfer) Contracts and its Variations such as BOT (Build-Operate-Transfer) and BOO (Build-Own-Operate), Reverse BOOT Contracts, Joint Ownership and Outright Sale.
Methodology and Estimating Issues

• Data for the study was largely obtained from the Report of the National Water Rehabilitation Project which is IBRD funded with the objective of improving water supply delivery by rehabilitating selected urban and semi-urban water supply schemes and institutional development.

• The study models the investment into the rehabilitation project and also simulates the cost recovery pattern and the profitability index with the attendant improved service delivery.

• The study sample covers ten Nigerian urban and semi-urban centres. The ten urban and semi-urban centres were chosen to limit the scope of the work. They cover a spread of both Northern and Southern Nigeria.
Methodology and Estimating Issues

• The recommended privatization model is a 20-years lease contract for already rehabilitated schemes, in which case, there is no investment risk for private sector participants.

• A 20-years concession contract in the form of Build, Operate and Transfer (BOT) option is also suggested to rehabilitate existing urban and semi-urban water supply schemes, in which case, the private sector participant takes investment as well as full commercial risks.
Methodology and Estimating Issues

- Data used for the study includes the recommended number of years for lease or concession contract, the rehabilitation investment cost, annual operation and maintenance cost in the rehabilitated systems, total number of systems available in each chosen state water agency, total number of systems rehabilitated under the IBRD funded project in each chosen state water agency, the population of the urban and semi-urban centres where the rehabilitated systems are sited, the pre-rehabilitation capacity of the systems, the post-rehabilitation capacity of the systems, the daily water production rate, the unaccounted-for-water, revenue collection efficiency and the recommended price of water.
Model Specification

- The Discounted Cash Flow (DCF) Principles including the Net Present Value method, the Internal Rate of Return method and the Discounted Payback Period method constitute our major model for the study.
- The Discounted Payback Period method serves as further check to have an idea of the breakeven point in our investment analysis.
- Thus, the Net Present Value (NPV), of our Investment opportunity at the firm’s cost of capital $K$ with constant cash flows that goes on for the life of the opportunity is given by
Model Specification

- **NPV**: \( K = (WRE - OM_{\text{cost}} [L - 1]) - RI_{\text{cost}} [K K (1+K)^N] \)

Where \((WRE - OM_{\text{cost}})\) is the net annual cash flow, \(RI_{\text{cost}}\) is the initial cash outlay and \(N\) is the life of the opportunity in years. \(NPV_K\) is often referred to as the Present Value of Annuity and the parenthesis in equation (I) is called the annuity factor obtained from standard annuity factor tables.

- **The Internal Rate of Return**, IRR is the exact DCF rate of return which the investment is expected to achieve, that is, the rate at which the NPV is zero and is given by
Model Specification

- **NPV**ₖ = 0 = \((WRE - OM_{cost}) \times \left(\frac{1}{1 + \frac{1}{IRR}}\right)\) \\
  \[\text{IRR} \times (1 + \text{IRR})^N\]

- The discounted payback period, PBP usually expressed in years (N) is the period it takes to recover the initial cash outlay on a capital investment in present value and is given by

- \(N\)

- \(NPV = 0 = \sum_{t=1}^{N} \left(\frac{WRE - OM_{cost - t}}{1 + K} \right) - RI_{cost}\)
Field visits were made to five Nigerian urban and semi-urban centres before and after rehabilitation and privatization for 12 months between April 2008 and March 2009.

Water samples were taken for water supply schemes into 1 litre plastic bottles and sterilized glass bottles, kept in cold boxes and transported to the laboratory for the physico-chemical and bacteriological analyses.
Pre and Post Privatisation Efficient Service Delivery

- Our mean net present value at the firm’s cost of capital, NPV $K$ is U.S $67,224,152.00 which is a measure of economic profit or excess return from our investment. Our mean internal rate of return, IRR is 28.35% which implies that our investment is generating a return much higher than the firm’s cost of capital, $K$ of 10%.

- It signifies that our investment would generate sufficient cash flow to pay the interest on loan, repay the actual loan capital and leave a mean surplus of U.S $67,224,152.00 for a mean investment cost of U.S $3,503,500 over the 20 years lease or concession contract for the rehabilitated systems in each of the state water agencies.
Pre and Post Privatisation Efficient Service Delivery

- It means that the return on investment in the Nigerian water supply sector for every U.S $1.0 is U.S $19.0 over the 20 years lease or concession contract period.

- It means that the return on investment in the Nigerian water supply sector for every U.S $1.0 is U.S $19.0 over the 20 years lease or concession contract period.

- On the side of efficient service delivery, our result indicates that at rehabilitation and private sector participant entry, the mean per capita per day water consumption in the chosen urban and semi-urban centres would have increased from 34 litres to 58 litres which is close to the mean per capita per day water consumption of 70 litres used for planning purposes in the provision of the water supply and sanitation policy of the Federal Republic of Nigeria.
Pre and Post Privatisation Efficient Service Delivery

- The mean daily water production from existing plants would have increased by 70% with mean capacity utilization of 84%. Unaccounted-for-water would have reduced from over 50% to 20% and mean water revenue collected which could hardly meet the cost of operation and maintenance would have increased to 65%.

- Bacteriologically, the post privatized and rehabilitated waters recorded zero faecal Coliform and total coliform counts, and this suggests that the systems have been properly disinfected before commissioning. Comparing the results of the bacteriological analyses with the WHO guidelines for potable water revealed that most of the pre privatized and rehabilitated waters were bacteriologically unsafe for drinking.

- Hence it is evident from our study that more of the Nigerian citizenry would have access to potable water with increase in the per capita per day water consumption and improved water quality through private sector participant.
Conclusion and Recommendation

- There are a number of obstacles facing private participation in the Nigerian water supply sector. The main sources of capital are likely to be foreigners and most foreigners may be reluctant to invest.
- Political uncertainty is high in Nigeria, and in traditional utilities the capital costs are high, the expected lifetime of the investment is long, and returns would be in local rather than foreign currency.
- Thus, investment appears quite risky and if foreign investors are willing to invest, they may demand a high risk premium. Moreover, privatization most often leads to higher prices for basic services such as water.
Conclusion and Recommendation

• Hence, to attract foreign investors on acceptable terms, government needs to create a favourable climate for business by providing macroeconomic stability, competitive taxes, freedom to repatriate capital, and all the aspects of governance that affect willingness to invest— including contract enforcement, low corruption and adherence to transparent rules, including for privatization (Ayogu [18]).

• At the same time, to protect against exploitation of a monopoly position, government should develop regulations that conform to international good practice for governance and pricing. An even better way to prevent abuse of monopoly power is to permit free entry and open competition where this is compatible with market size and technology.