
An Appraisal of Water Infrastructure Projects' Financing Challenges in South Africa

An Appraisal
of Water
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Abstract

Purpose – Targets set out by state institutions, with respect to supplying water to deprived communities, seem to be idealistic and not realistic. Study envisioned to assess challenges of financing water infrastructure projects, and determines the role of the state towards infrastructure development by holistically planning and engaging with the private sector.

Design/Methodology/Approach – The study adopted a quantitative approach, whereby a questionnaire survey was conducted among different stakeholders involved in water infrastructure projects in South Africa. Data gathered were analysed using percentages, mean item score and standard deviation.

Findings – The study revealed that most challenges affecting the success of the financing of water infrastructure projects in South Africa are corruption, hostility towards private participation, cost recovery constraints, high fiscal deficits by state government, unreliable planning and procurement processes, and a rapid increasing number of municipalities that lack technical and administrative capacity to plan implement, operate and maintain water assets.

Research Limitations/Implications – This research paper investigates projects' financing challenges with a broad inspection on the role of the public sector. The apparent role of the international structures such as OECD, IMF and World Bank had no influence in the study. From the findings, it is clear that the central government and state institutions lack the necessary resources to accelerate infrastructure development, water infrastructure in particular. The study, thus, recommends a complete expansion and development of state capacity as well as improved collaborations with the private sector to drive the success delivery of services to the public.

Originality/Value – Improved and flexible regulations and legislative guidelines are required to ensure that both sectors fulfil their side of the bargain, with an ultimate goal of meeting the predetermined targets of supplying adequate water to the deprived communities.

Keywords Service delivery, Water infrastructure investment, Economic growth, Government funding, Private financing, Financing constraints

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1. Introduction

[Kudumela \(2015\)](#) enunciates that infrastructure is critical for the much needed socio-economic benefits in developing countries. Infrastructure is categorised mainly in two forms, namely, economic infrastructure and social infrastructure ([World Bank, 2013](#)). [Kudumela \(2015\)](#) articulates that there is a recognisable link between the two forms of infrastructure and the economic growth, the gross domestic product (GDP) of countries that immensely invest in infrastructure has shown a rapid increase. The infrastructure that contribute to the economic growth of any country include physical assets such as water and power infrastructure, railways, distribution pipes, roads and telecommunication networks. While activities that endorse the social wellbeing/welfare of the public include adequate healthcare, water and power supply, sanitation and education (The Presidency Republic of South Africa and Development Bank of Southern Africa, 2012). Among other forms of infrastructure, water infrastructure as one of the critical physical infrastructure assets was assessed in detail. As the late former President of South Africa Nelson Mandela said, “Among the many things that I learned as president was the centrality of water in the social, political and economic affairs of the country, the continent and the world” ([National Treasury, 2011](#)).

However, access to safe drinking water is still a challenge in developing countries, especially in South Africa. Challenges encountered concerning the delivery of water to the public include but not limited to miscommunication between different water agencies/boards, limited resources, leakages in official spending and lack of monitoring progress of different water projects ([Saxena, 2005](#); [National Treasury, 2011](#)). More so, the experienced increased budgets for the water sector has not alleviated the alarming challenges of adequately supplying adequate water to the public ([Saxena, 2005](#)); there is also a cause for concern of the sustainability of the existing resources (ill-equipped infrastructure) ([National Treasury, 2011](#)), as well as the general under-pricing of water across the value chain ([National Treasury, 2011](#)).

[Schneider \(2007\)](#) alludes that the financing of water infrastructure in South Africa is mainly undertaken by the central government, state-owned entities, as well as the water boards existing in each province. State-owned entities responsible for the financing, operation and maintenance of bulk water infrastructure include the Trans Caledon Tunnel Authority (TCTA), Water Trading Entity (WTE) and Komati Basin Water Authority (KOBWA; [Calitz and Fourie, 2007](#)). There is a limited involvement of private financing in the water sector in South Africa.

[Helm \(2010\)](#) clearly illustrates that many private companies and investors do not participate fully in water infrastructure financing as it does not offer competitive risk-adjusted returns. There are no models in place to assure investors that their investments will be treated fairly and that returns will be received based on the capital invested ([Helm, 2010](#); [Bielenberg et al. 2016](#)). There are institutional investors that may be willing to accept the lower returns but they too still need their investment to be treated fairly and kept safe. Inadequate risk-adjusted returns are highly recognised as a challenge to private funding for water infrastructure projects ([Helm, 2010](#)).

For countries to flourish economically and socially, infrastructure development, infrastructure investment in particular, needs to be prioritised; unfortunately, challenges such as cost overruns, rapid occurrence of delays, lack of funding and skills contribute to the deprivation of the much-needed infrastructure. This study only looked at the challenges of funding water infrastructure projects, as well as the role played by the state as to ensure a comprehensive engagement with private corporations for improved financing in the water sector.

2. Challenges of financing water infrastructure projects

[Uzuegbunam \(2005\)](#) enunciates that among other things, the future of developing economies is determined by the success of infrastructure development, and the extent to which economic growth in urban areas is managed. This requires governments to take a leading role in the acceleration and improvement of infrastructure development. Central governments need to perfect infrastructure planning and financing. However, the Presidency in the Republic of South Africa and Development Bank of Southern Africa (2012) shared that financial institutions are key players for infrastructure development, but they are hesitant to provide financial assistance to central governments for public infrastructure projects owing to little or no creditworthiness. This is especially so in low-income countries, where they cannot depend on the history of the municipalities to justify their creditworthiness; however, this can be judged by information provided in the project proposal and the availability of assets put forth by the borrower (Presidency Republic of South Africa and Development Bank of Southern Africa, 2012). Owing to the instability of the developing economies, lenders require security that can be taken as a result of any incidents that may occur, thus increasing risk premiums which end up increasing the cost of financing ([Snieska and Simkunaite, 2009](#); [Bond *et al.* 2012](#); [Friedman, 2016](#)).

More so, challenges affecting the central governments also include corruption. Infrastructure development involves the construction of infrastructure facilities, water plants and distribution pipes; different stakeholders are involved during the procurement processes, government being the primary participant. Other participants include contractors, consulting engineers, suppliers and sub-contractors ([Kenny, 2007](#)). Owing to a large number of stakeholders, transparency and accountability is compromised, and as a result, corruption surfaces. According to [Bowen *et al.* \(2012\)](#), government officials, contractors and sub-contractors are participants likely involved in corrupt activities in construction projects. [Bowen *et al.* \(2012\)](#) continues to outline forms of corruption as conflict of interest, bribes and tender rigging. Outcomes of corruption produce incomplete projects, delayed projects (owing to arbitration proceedings), misplaced and misused funds, compromised safety methods as well as poor quality products.

Additionally, [Bond *et al.* \(2012\)](#) emphasises that other startling challenges facing the success financing of water infrastructure include high transactions costs, financial sector impediments, lack of projects development capacity, lack of credit history and cost recovery constraints. Moreover, inadequate funding of public infrastructure projects in India occur because of lack of leadership amongst state personnel, overlapping institutional responsibilities as well as poor urban planning ([The High Power Expert Committee, 2011](#)). In addition, inadequate investments in water infrastructure projects, fragmented institutional set up and capacity constraints are also challenges facing the financing of water infrastructure projects, shares HPEC (2011). [Cities Development Initiative for Asia \(2010\)](#) concluded that high fiscal deficit and the dearth of funds in domestic markets enormously affects adequate financing of public assets. [Lam \(1999\)](#) and [Hart \(1995\)](#) on the other hand assert that domestic banks as well as capital markets are not yet developed in developing economies to an extent that they can adequately fund public infrastructure projects to encourage economic prosperity in various communities. Likewise, [Investopedia \(2017\)](#) adds that financial sector impediments occur as a result of licensure laws, capital requirements, regulatory compliance and inadequate access to financing.

The central government has been solely responsible for planning, financing, operating and maintaining public infrastructure assets over the years, the current rate of urbanisation, corruption and incompetency are among challenges adding to inadequate fiscal budgets made by the central government ([Sanusi, 2012](#)). Further, availability of long-term funds

between the periods of 10-15 years for investment prospects at reasonable interest continue to be limited for water projects (Ikpefan, 2010). As a result, communities continue to experience no access to water and power supply, no disposal and waste treatment, as well as poor road maintenance and construction.

Asian Development Bank (2010) explains that the central government in China issues unnecessary guarantees and subsidies to corporations that offer their services of building/maintaining public facilities and services across China. Corporations that have experienced such privilege from the municipalities include XIIG, and other sub-contractors that fall under the XIIG got guarantees in the form of purchase contracts and on-lent public loans (Asian Development Bank, 2010). As much as the guarantees serve a good purpose short time, in the long-term, they do not given that the government does not fulfil what is required of them. Baietti *et al.* (2012) further advise that decision-makers should avoid resorting to implicit agreements on guarantees for various urban projects. Guarantees and subsidies provided should be purely based on the area of the public infrastructure projects and a differentiation between profitable and non-profitable urban projects must take place to ensure that different financing mechanisms are used to finance each project (Asian Development Bank, 2010).

In addition to the bottlenecks experienced by the central government, municipalities fail to undertake reliable and viable projects shares Jerome (2011). Because of the lack of experience within the municipal departments, disjointed planning, poor formulation of costs and revenues contribute to the slow progression of water infrastructure development. However, municipalities are well equipped with identifying facilities and services required in various communities to encourage adequate welfare and growth, but they struggle to identify projects that can be funded by banks or even prepare projects for such financing. Thus, for municipalities to carry out viable and bankable projects there needs to be private sector involvement to provide technical assistance and create project development facilities, to provide financial, technical and managerial support, such as the one developed in South Africa, Municipal Infrastructure Investment Unit (Bond *et al.*, 2012).

3. Research Methodology

A survey approach was adopted where different professionals were sampled. The respondents had to state whether they have been involved in water projects, and if they have, how many. Respondents were inclusive of the Department of Water and Sanitation, water boards, metropolitan, Trans-Caledon Authority Tunnel, building and construction professionals and banks. Respondents were selected as a result of a vast experience on infrastructure development in South Africa.

The research areas were within South Africa, including Mpumalanga, Gauteng and Limpopo. A quantitative approach was adopted to collect data and a structured questionnaire was thus distributed. Google forms were used for areas in which the researcher could not physically distribute. The distribution was undertaken using convenience sampling, which is referred to as a non-random sampling method. Convenience sampling was chosen as a result of limited resources to conduct the study; this includes limited access to specific government officials and executives. Etikan, Musa and Alkassim (2016) share that convenience sampling technique is simple and inexpensive. One hundred and fifty questionnaires (online and physical) were distributed to readily accessible respondents; 96 were returned of which 91 were usable, which represented a 61per cent response rate. Out of 128 questionnaires, only 86 physical copies were returned, while out of 22 questionnaires sent via google form, only 10 were returned. It took 20 minutes to complete the questionnaire. Face validity was adopted in the study. Prior to data collection, which

took eight weeks, a computer software version 24 of the Statistical Package for Social Sciences (SPSS) was used to conduct the analysis of the study; the software with the data received provided mean item scores, standard deviations, frequencies, percentages and Cronbach's alpha values. The Cronbach's alpha value obtained was 0.945, showing internal consistency. According to [Sekaran \(2007\)](#), the acceptable Cronbach's alpha value for a consistent questionnaire is from 0.7 upward.

4. Findings and Discussion

4.1. Background information of respondents

The employment organisations of respondents reveal that the building and construction sector was the most represented with 23.1 per cent, public entities 18.7 per cent, metropolitans 13.2 per cent, water boards 11 per cent and the Department of Water and Sanitation with 9.9 per cent. Years of experience of the sampled respondents reveal that 45.1 per cent had experience between 4-8 years; 28.6 per cent had experience between 9-15 years and 19.8 per cent had experience up to 3 years. Furthermore, 47.3 per cent of the respondents participated in water infrastructure projects, while 52.7 per cent did not participate in any water infrastructure projects. Respondents' involvement in water infrastructure projects show that 52.7 per cent did not take part in any water infrastructure projects, while 14.3 per cent participated in two projects and 11 per cent took part in three projects. Provinces where respondents were involved in water infrastructure projects show that 23.1 per cent of the water infrastructure projects were in Gauteng, 23.1 per cent in Limpopo and 10.9 per cent were in Mpumalanga. The background information of the respondents show that 47.3 per cent of the respondents had knowledge about water infrastructure projects, which is adequate for an informative study. While 52.7 per cent reveals that the respondents have knowledge on other forms of infrastructure projects, which is also critical for the contribution of this study.

4.2. Challenges of water infrastructure financing

Descriptive analysis was used to determine the level of agreement among the respondents with regards to challenges of water infrastructure financing. [Table 1](#) presents the respondents' ranking of the challenges of water infrastructure financing in South Africa. Corruption, limited private participation, weak project structuring, high fiscal deficits, cost

Challenges	\bar{x}	σX	<i>R</i>
Corruption	4.49	0.705	1
Hostile to private participation	4.29	0.764	2
Weak project structuring	4.24	0.735	3
High fiscal deficits by state government	4.23	0.790	4
Cost recovery constraints	4.23	0.857	4
High credit risk for private financing	4.21	0.738	5
Unreliable planning and procurement processes	4.20	0.897	6
Insufficient municipal revenues	4.18	0.838	7
Financial sector obstacles	4.15	0.788	8
Insufficient subsidies	4.14	0.797	9
Lack of political and administrative stability	4.14	0.851	9
Dearth of funds in domestic markets	4.13	0.921	10
Lack of creditworthiness among municipalities	4.12	0.786	11
High development and transaction cost	4.12	0.800	11

Table 1.
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recovery constraints, high credit risk as well as unreliable planning and procurement systems were major challenges affecting water infrastructure financing. Furthermore, insufficient municipal revenues, financial sector obstacles, insufficient subsidies and political instability negatively affected the financing of water infrastructure projects. Additionally, results show that inadequate private inclusion for infrastructure development affect the development of South Africa from economically prospering.

The findings show that corruption in the form of conflict of interest, bribes and tender rigging have significant impact on the financing of water infrastructure projects (Bowen *et al.*, 2012). The implications of corruption produce delays and escalation of costs, as well as compromise methods of safety. Hartig (2008), Jerome (2011), Oyedele (2012) and Verma (2016) coincides with the findings that municipalities lack technical and administrative capacity to plan, implement, operate and maintain public assets. Jerome (2011) thus suggests that municipalities have a major role to play through the expansion and development of state capacity to handle major projects. More so, insufficient municipal revenues, inadequate infrastructure funding and financial sector obstacles affect water infrastructure financing. Snieska and Simkunaite (2009) and Mohanty *et al.* (2011) highlight that private financing is limited for water infrastructure projects; Helm (2010) shares that this is mainly because public sector institutions do not provide competitive risk-adjusted returns.

The Presidency in the Republic of South Africa and Development Bank of Southern Africa (2012) enunciates that as much as the public sector plays a leading role in the development of infrastructure, private participation is still required. However, the findings concurred with Lam (1999), Hartig (2008), Helm (2010) and HPEC (2011) that financial sector impediments and inadequate funding models prohibit the delivery of water infrastructure assets that will improve the economic and social progression of different communities. Lam (1999) accords that this is because of domestic banks and capital markets not being fully developed to an extent that they can sufficiently finance water infrastructure projects without affecting the financial stability of the institution itself.

5. Conclusions

Using a survey approach, the study has been able to ascertain the perceived challenges prohibiting the success of financing water infrastructure projects. The perceived challenges affecting water infrastructure financing is corruption, in the form of conflict of interest, bribes and tender rigging/collusion. Moreover, other challenges include hostile to private financing, inadequate financial viable projects, non-transparent financial management of local governments and high noticeable credit risk for private financing. It is, therefore, recommended that central governments play a leading role towards infrastructure investments; this can be through the evaluation and monitoring of the existing models/frameworks of financing mega projects. Projects should also be prioritised according to their actual investments to allow investors to make informed decisions. The expansion and development of state capacity to allow for adequate planning, financing and delivery of public assets should be encouraged through a comprehensive and holistic engagement with private corporations.

The study has brought to light the perceived challenges affecting the success of financing public infrastructure in South Africa, water infrastructure assets in particular, with a view to provide possible solutions mainly for central governments on how they can improve their technical and administrative capacity to plan, implement, operate and maintain public assets. The introduction of private participation towards providing financial resources to deliver the necessary facilities can go a long way in providing the required services to different communities and the country at large. Central governments are

expected to play a leading role towards developing and ensuring the sustainability of the partnership between the public and private sector. Public-private partnerships, are among the few initiatives to gear up collaborations between the two parties; this further includes assuring political will from the central governments, and better rates imposed by private utilities to the public for the services provided.

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