academicJournals

Vol. 5(3), pp. 41-56, July 2013
DOI: 10.5897/JASD13.001
ISSN 2141 -2189 ©2013 Academic Journals
http://www.academicjournlas.org/JASD

Journal of African Studies and Development

Full Length Research Paper

Who will foot the bill? Water services infrastructure backlog in Sub-Saharan Africa

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Accepted 15 May 2013

Investment in the water services infrastructure remains one of the major challenges that many countries in Sub-Saharan Africa (SSA) are facing. Current levels of investment in the sector, from both private and public sources, are only a quarter of the expenditure needed to meet the growing demand from the rapidly growing urban population as well as the positive economic growth experienced in the last decade. Contrary to the widely held view that private sector investment will meet the funding gap in the water and sanitation services (WSS) sector, available evidence shows that private sector investment in WSS infrastructure in SSA has been insignificant. Using recent data from various sources, this paper illustrates that the larger proportion of infrastructure investments from private investors have been going to sectors perceived to be less risky, with high profit and shorter pay-back period, mainly telecommunications (ICT). The bulk of funding to the WSS, in most countries has been coming from public resources, mainly government and bilateral donors. Given the prevailing socio-economic conditions in which most WSS utilities in Africa operate, the prospect of attracting private investment are very low. Consequently, infrastructure expenditure for WSS will continue to rely on public sources.

Key words: Infrastructure, water and sanitation, Sub-Saharan Africa, private sector, public sector.

INTRODUCTION

Physical infrastructure[1] plays a pivotal role not only in stimulating and supporting economic growth, but also in promoting social and human development. Poor or inadequate infrastructure contributes to weak economic growth performance, which in turn affects social and human development conditions. Several studies on the status of infrastructure in SSA have noted that lack and poor state of infrastructure has contributed significantly to poor economic growth outcomes (Estache, 2006; Ayogu, 2006; Foster, 2008; Calderon, 2009; Foster and Briceno-Gramendia, 2010). Current evidence on the contribution of infrastructure to growth in SSA suggests that infrastructure has the potential to contribute up to three percentage points of gross domestic product (GDP) per year[2]. According to the African Development Bank (AfDB, 2010), the poor state of infrastructure in most African countries contributes to higher access and production costs which make the continent less competitive.

Over the past decade, the importance of infrastructure for economic and social development in Africa has been widely acknowledged, with most analysts highlighting the challenges presented by the huge infrastructure deficit. While there has been a wide acknowledgment of infrastructure backlog and the challenges this brings in general, there has beenlittle discussion on the possible

[1] The term infrastructure here is used to refer to the "economic infrastructure" representing four major sectors: transport, energy, water and sanitation and telecommunication.

[2] Although Calderon's study refers to transport (mainly road), energy and telecommunication infrastructure, the general case for the role of infrastructure, in general, has been confirmed in the literature (see Calderon, 2009:16).

strategies of funding the existing infrastructure gap, particularly in the WSS sector. The main purpose of this paper is to illustrate that the main source of infrastructure funding in WSS has been and will continue to be public resources, contrary to dominant views that the private sector will cover the WSS infrastructure funding gap. During the 1990s, there were high expectations that the private sector, through initiatives such as Public, Private Partnerships (PPPs), and the Private Sector Participation (PSP), would provide the much needed infrastructure investments, but as this paper shows, private sector participation particularly in WSS infrastructure has been insignificant, and there are no signs that this will change in the near future. This view has been confirmed by recent studies on infrastructure in Africa, mainly conducted by the Africa Infrastructure Country Diagnostic (AICD) project, which has shown that private sector engagement has been largely limited to the Information and Communication Technology (ICT) sector, where private sector investments accounts for more than 80% of total investments (ICA, 2011). Based on the analysis of the existing data on infrastructure investment in the four major sectors (water, energy, communication and transport), the paper argues that infrastructure funding for WSS in SSA will continue to rely on public sources. Thus, strategies to meet the infrastructure funding gap in WSS sector in Sub-Saharan Africa will have to take this into account really.

The main contribution of the paper is to highlight the challenges of meeting the infrastructure funding gap, particularly in the WSS sector, given that the prospect of attracting private investments in this sector is very slim, and that most governments have limited resources for infrastructure investments, and often the allocation of public resources to WSS "is by far the lowest, at about 1% compared to power, transport or telecommunications" (Barnejee et al., 2008a). In this context, this paper draws attention to the fact that the WSS sector faces the biggest challenge with regard to infrastructure funding gap, and therefore, the debates on infrastructure and funding strategies (which so far seem to underestimate the WSS challenges) have to underline this.

The rest of the paper is organized as follows: The next section briefly gives an overview of the infrastructure funding-gap by sector. Section two briefly outlines the general debate on private sector involvement in the WSS sector. Section three presents data on infrastructure investment in SSA, comparing WSS services infrastructure with other sectors. Section four presents water utility basic indicators from selected countries as the context in which many African WSS utilities operate. This section also discusses some of the key reasons for the low private sector investment in WSS. Section five highlights the policy implications of this scenario and suggests some possible policy options for WSS. The last section offers some concluding remarks.

SSA infrastructure backlog

A discussion of infrastructure in SSA has to acknowledge the fact that there are huge disparities in terms of infrastructure gaps between countries in the region (Banerjee and Morella, 2011). However, available estimates of the infrastructure funding gap suggest that, on average, countries in SSA will have to double their current infrastructure spending in order to meet the growing demand for infrastructure services (Foster and Briceno-Garmendia, 2010). While there are infrastructure gaps in the energy and transport sector as well, this paper focuses on the challenges in the water supply and sanitation (WSS), for the simple reason that the sector does not only face the largest funding gap ratio, but also has the lowest prospect of attracting investment especially from private financiers in poor countries and cities in SSA (Banerjee et al., 2008b). Further, the WSS receives the lowest allocation of public resources, and in most cases only a fraction of the allocated public resources ends up being spent in the sector (Chitonge, 2011). Although the situation seems to be improving, meeting the infrastructure funding needs for WSS sector remains a major challenge for most countries in the region, and "private sector participation in urban water supply has been scarce" (Torress, 2012). Since the early 1990s, the WSS has largely failed to attract significant private sector participation when compared with other sectors, and the prospect for attracting private investments, especially in infrastructure is slim (Alves, 2011). Thus strategies targeting private sector investments into Africa's infrastructure through various funding initiatives such as commodity-linked bonds, diaspora bonds, private equity funds (AfDB, 2011), while they may work for the ICT and transport sectors, there is no evidence that these can be viable funding strategies for WSS infrastructure financing.

Over the past decade, the inadequacy and poor state of infrastructure in Africa, and SSA in particular, has been highlighted by many analysts and researchers. The infrastructure challenge for SSA is most evident when the current spending on infrastructure is compared to the needed funding to meet current demand which is rapidly growing due to population growth, but also due to the steadily expanding economies, especially over the past decade. Table 1 shows that the WSS and energy sectors face the biggest infrastructure investment funding gaps, of over 270 and 200%, respectively.

Although in absolute terms, the energy sector has the largest annual funding deficit (US$27 billion) compared to

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Table 1. SSA infrastructure current spending and needs US$ billion.

	WSS	Energy	ICT	Transport	Total
Current spending					
O & M	3.1	7	4.6	8.8	23.5
Capital expenditure	2.8	6.8	5.4	8.9	23.9
Total	5.9	13.8	10	17.7	47.4
Spending needs					
O & M	7	14.1	2	9.4	32.5
Capital expenditure	14.9	26.7	7	8.8	57.4
Total	21.9	40.8	9	18.2	89.9
Spending gap	16.0	27.0	(1)	0.5	42.5
Spending gap (%)	271.2	195.7	(10.0)	2.8	89.7

Source: Author Based on Data from Brinceno-Garmendia et al. (2008). Note: these figures exclude O & M and infrastructure for irrigation. Figures in brackets indicate excess funding. [O & M]=operation and maintenance costs. [WSS]=water supply and sanitation. [ICT]=Information and communication technology.

Table 2. SSA infrastructure resource allocation by sector (US billion).

	Water	Energy	Transport	ICT	Multi	Total	Water %
2006	1.8	2.4	3.2	0.5	0.9	8.8	20.5
2007	2.9	3.9	3.6	0.5	0.9	11.8	24.6
2008	2.6	3.6	5.9	0.3	1.3	13.7	19.0
2009	2.2	6.7	7.5	0.7	0.7	17.8	12.4
2010	3.8	12.9	6.9	0.8	0.3	24.7	15.4
Total	13.3	29.5	27.1	2.8	4.1	76.8	
Sector %	17.3	38.4	35.3	3.6	5.3		

Source: Author based on data from the ICA, 2010 Report (ICA, 2011). Note: these are allocations by the ICA with funding coming from ICA members.

WSS (US$16 billion), the WSS sector has the largest deficit ratio. In contrast, if the estimates in Table1 are correct, the ICT sector is overfunded, while the transport sector has only a small funding shortfall. Of course, figures for individual countries are very different from these regional aggregates; some countries have much higher funding deficits while others have very low funding gaps. Generally, the few middle-income countries tend to have low infrastructure backlog when compared to low-income countries (Banerjee and Morella, 2011). Nonetheless, the magnitude of the gap in many countries is large. Recent infrastructure resource allocation trends in the region do not show any significant change to the scenario presented in Table 1. Although private capital flow into SSA, especially from China, has started to show signs of diversifying into other sectors, the bulk of private capital is still going into ICT and related sectors(Hou et al., 2013). The share of resources allocated to the WSS sector has, in fact, been falling over the last couple of years as Table 2 shows.

In this context, it is imperative to look closely at the WSS sector. While access levels for energy (mainly electricity) may be lower than that for WSS, most countries in SSA, water services infrastructure[3] faces the most serious infrastructure investment challenges. There are several reasons for the huge infrastructure gap in the WSS, including the fact that private sector investments have been shying away from WSS sector (Alves, 2011).

The private sector in the water supply services debate

Since the 1990s, investment in the WSS sector infrastructure has been a hotly debated topic. While the infrastructure funding gap has been widely recognized, the thrust of the debate has been on how this investment gap in Africa should be financed. At the beginning of the 1990s there was great optimism, especially among international development agencies, that the involvement of the private sector would bring the much needed capital investments as well as efficient management skills into

[3] This refers to both water and sanitation, unless otherwise stated.

the water services sector.

In the early 1990s, utilities in Africa looked towards private participation in infrastructure (PPI) as a potential vehicle for cost recovery and new investment. The premise was that private management and operation of utilities would generate improved efficiencies and enhance service quality, thereby attracting additional financing to the provider, both through direct investment and through augmented ability to access market financing (Banerjee et al., 2008b:68).

Many politicians, policy makers and development finance analysts saw the involvement of the private sector as the only way to raise the massive WSS infrastructure capital investments needed in many SSA countries. One of the main reasons often cited for inviting private investment into the WSS sector is that most governments in low income countries have inadequate resources to meet the infrastructure investment needs, and many water utilities are unable to raise enough internal revenue to cover operation and maintenance (O&M) and capital expenditure costs. Proponents of the commercial funding model have argued that "Governments with many pressing and competing commitments for budgetary transfers cannot be relied on entirely to financially support water utility operation, let alone capital investment needs" (Baietti and Curiel, 2005). Other analysts saw private investment as an indispensable source of infrastructure funding, even in the water services sector:

….in reality the quantum of investment required to restore and expand our infrastructure to the levels we require is so enormous that financing it through public borrowing or increased taxes is untenable – the gap between infrastructure needs and available public sector resources has grown so wide it cannot be closed. So, truly, there is no alternative but to seek private sector capital to help fill this funding gap (PwC, 2004).

The other argument advanced in support of private sector participation in the WSS sector includes the view that public investments are often constrained by inefficiencies, unnecessary red tape, low capacity, corruption and lack of financial discipline. It was also argued that most municipalities and water utility companies in low income countries find it extremely difficult to access investment funds from capital or financial markets because of their low credit worthiness (DESA, 2004), and also because of the underdeveloped local financial and capital markets in Sub-Saharan Africa (Irving and Manroth, 2009). Thus, inviting private sector actor with higher credit rating and wider access to international finance and capital market was expected to leverage more investment capital into WSS. Richard (1997) sums up the general argument advanced in support of private sector participation in WSS: Private sector participation is seen to increase efficiency and introduce new sources of finance but above all to require a new emphasis on proactive, performance oriented, commercial management that aims to match the demand of its customers with their willingness to pay realistic charges and tariffs (in Hall and Lobina, 2006).

Most proponents of the private sector participation model, however, see private investments not as a replacement, but often as a complementary (in some cases, the major) source of funding and management skills. For example, the IMF report on private sector participation argues that "private financing can support increased infrastructure investment without immediately adding to government borrowing and debt…"(IMF, 2004).

However, after years of experience with PPPS and PSP in WSS, it is apparent that the case for private finance was oversold, especially in SSA. Only a handful of countries managed to attract private capital into the WSS, and most of these projects are either cancelled or in serious distress, with a high failure rate ranging from 25% for leases to 50% for concessions (Torres, 2012). Questions have been raised about whether the private sector can play any significant role in financing infrastructure development in the WWS sector in general (Hall and Lobina, 2006), and more specifically in low income countries in SSA (DESA, 2004). This debate has heightened now when cumulative evidence shows that the role of private investments in WSS infrastructure has been insignificant, despite consistent efforts and incentives to attract private finance (McDonald and Ruiters, 2005). Generally, experience with private sector participation in the water sector has been disappointing. According to Prasad,

The experience of water companies in developing and developed countries demonstrates that PSP in the water sector has a very unreliable record. There has been bribery, corruption, non-compliance with contractual agreements, lay-offs, tariff increases, and environmental pollution. 'Sign and negotiate' is the order of the day (Prasad, 2006).

Regarding the claim that private sector participation results in increased efficiency, studies conducted in different parts of the world show that private sector operations do not possess a superior advantage over public sector operations (World Bank, 2003; Ouyahia, 2006). A study conducted on behalf of the World Bank acknowledges that, "efficiency is not significantly different in private companies than in public ones" (Estache and Rossi, 2002). Similarly an IMF study on PPPs in different countries and sectors concludes that it "cannot be taken for granted that PPPs are more efficient than public investment and government supply of services"(IMF, 2004). The IMF study reports that in cases where PPS exist, the participating private entity leaves the government to bear most of the costs and the risks involved

Table 3. Source of current O&M and funding for infrastructure funding in SSA (US$ billion).

	WSS	Energy	ICT	Transport	Total
Public sector					
O & M	3.1	7	4.6	8.8	23.5
Infrastructure	1.4	2.7	1.7	5.5	11.3
Total	4.5	9.7	6.3	14.3	34.8
Official development assistance (ODA)					
O & M	00	00	00	00	00
Infrastructure	1.1	0.8	0.1	1.7	3.7
Private participation in infrastructure (PPI)					
O & M	00	00	00	00	00
Infrastructure	00	1.1	3.1	0.6	4.8

Source: Author based on data from Brinceno-Garmendia et al. (2008). Note: these figures exclude O & M and infrastructure for irrigation.O & M=operation and maintenance costs. WSS=water supply and sanitation. ICT Information and communication technology.

in the partnership (ibid). For instance, although 30 out of the 46 water utilities in Africa reported private sector participation, since the 1990 most of these private sector engage-ments are in the form of management contracts and leases which carry less investment risks. It has further been observed that the "participation of the private sector in WSS has taken the form of management and lease contracts without any substantial investments" (Banerjee et al., 2008b). Table 3 shows that for the WSS sector, current funding for O&M as well as infrastructure is entirely from public sources.

There is no funding from private sector for either O&M or infrastructure also. Further, in cases where private investments have occurred, often the public sector is called in to guarantee private capital from commercial, political and regulatory risks (Sheppard et al., 2006)[4].

As for the WSS sector, there has been insignificant private investment going to WSS infrastructure in SSA, despite intense campaign by international finance insti-tutions and development agencies to lure private capital into the WSS sector.

A long term review of private sector investments also reveals that from the 1990s investment with private sector participation has been an insignificant source of funding for WSS, with most of the years receiving no private capital (Figure 2). For WSS, more than 97% of investments over this period came from public sources.

[4] For example, the US$51.1 million Safaricom investment in Kenya (in 2001) was guaranteed by the Belgium Export Credit Agency, the US$7 million MTN investment in Uganda (in 2001) was guaranteed by the Swedish International Development Agency (SIDA), the US27 million Uganda Telecom (in 2003) was guaranteed by public bonds, and the US$41 million Orange Cameroon investment (in 2003) was jointly guaranteed by the World bank's International Financial Corporation (IFC) and PROPARCO (Shephard, von Klaudy & Kumar, 2006:3).

SSA infrastructure investment trends

Data and Methods

This paper has largely relied on secondary data to analyze the infrastructure investment trends and pro-spects, focusing on WSS. Using secondary data is appropriate here given the nature of the issues examined. Due to the scanty nature of data on infrastructure in SSA, the paper has combined data from different sources to illustrate the main point. The analysis in this paper has focused on urban water services, mainly because there is little information available on rural water services in most countries. Although there are several ways of looking at the challenges of water services in SSA, such as legal and policy, technological as well as tenure challenges, this paper has focused on the infrastructure funding backlog side of the challenges. Performance indicators for selected water utilities in the region are also discussed to highlight the context in which most water utilities in SSA operate. Although the data used in the paper are largely aggregated and of a patchy nature, it is possible to get a sense of what is happening in terms of infrastructure funding gaps and what the role of the private sector has been so far.

Information presented in this paper is assembled from different sources, mainly from the Private Participation in Infrastructure (PPI)/Public-Private Infrastructure Advisory Facility (PIAF) project, the Infrastructure Consortium for Africa (ICA), International Benchmarking Network for Water and Sanitation (IBNET) and the Africa Infra-structure Country Diagnostic (AICD) databases. Even after combining data from these different sources, data on WSS infrastructure investment in SSA are still patchy, with many countries reporting missing data on several variables and years. Further, it is important to note that

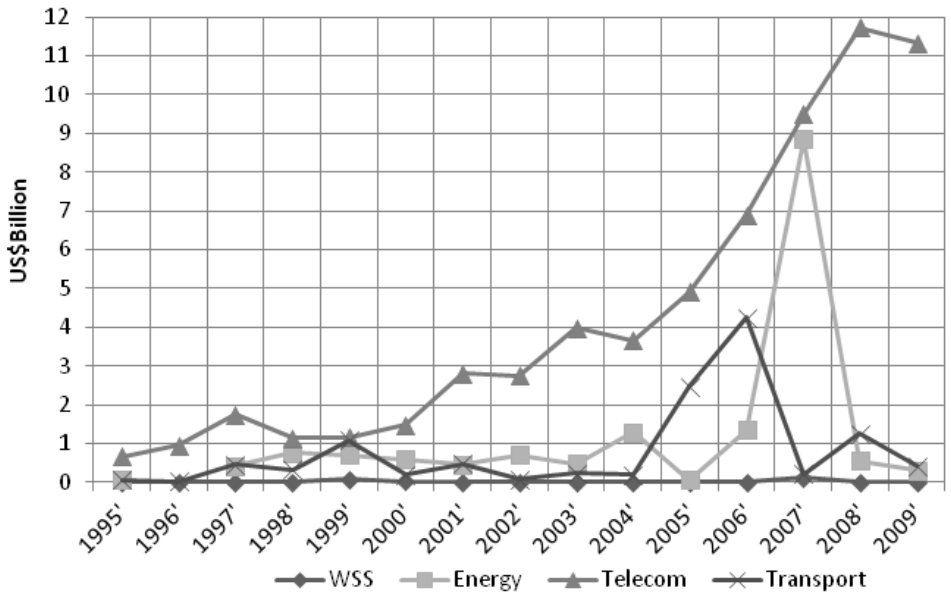

Figure 1. PPI in SSA infrastructure investment trend by sector (1994-2007).
Source: Based on data from PPI Project Database (www.ppi.worldbank.org).

PPI projects do not represent private investments only; these projects include investments from public sources as well, since most PPI projects are implemented as partnerships between the private and public sectors (PPP). Certainly, most of the projects reported as PPI have sourced funding through the development banks such as the African Development Bank (Banerjee et al., 2008b).

For a project to be counted as a PPI project, it must satisfy five key conditions[5]. Therefore, not all PPPs or PSP are included as PPI, and not all the figures reported as PPI represent private investments. In this case, one of the main limitations of the data is that the information is highly aggregated, making it difficult to know exactly what proportion of investment commitments are from private and public sources. Available data also raise unresolved questions about the "grey" capital investments such as investments projects guaranteed by donors (bilateral) and international financial (multilateral) institutions. There is also a certain level of ambiguity in deciding what projects qualify as a PPI project. For instance it is not clear what proportion of the population should a project provide service to for it to be counted as a PPI project. However, by combining the different sources of information, a profile of the WSS sector funding in SSA can be constructed.

A review of projects with private sector participation in SSA between 1994 and 2010 shows that the larger proportion of private sector investments has been going to the ICT sector, which has been capturing over 80% of the total PPI investment in SSA. As for WSS, PPI investments have been an insignificant source since the 1990s as Figure 1 shows.

Between 1994 and 2010 PPI contribution to ICT has been consistently over 95% of the total investments to the sector. On the other hand, PPI contribution to WSS has been minuscule and unpredictable over the same period, with no new funds committed between 2007 and 2012. Only two sizeable investments have taken place since 1994 with US$83 million in 1999 and US$121 million in 2007 as Figure 2 shows.

Low levels of PPI investment in WSS become clear when compared to PPI investment in ICT which has averaged US$2 billion per year since 2000.

In terms of both project size (value of investment) and number, WSS has the lowest share as Table 4 shows. Out of the 382 PPI projects recorded in SSA between 1994 and 2010, only 26 projects were in the water sector, with a total value of only US$266 million, compared to 177 projects for telecommunication with a total value of about US$85.3 billion; 112 for energy with a total value of about US$10.4 billion, and 92 for transport with a total

[5] These are:
i) that the private operator or company should have share (usually 25%) of the project's operating risks (that is overruns and operator's failures).
ii) that a project reaches financial closure (i.e., signing or conclusion of relevant contractual obligation).
iii) that the project in which a private investor is involved should provide significant services to the public and not to a small section of society.
iv)that a project must involve ownership of immovable assets required to provide infrastructure services.
v) that the project be involved in the provision of energy (electricity etc), water services (treatment plant and distribution network), transport(airport, rail, seaport and road) and telecommunication(fixed and mobile).

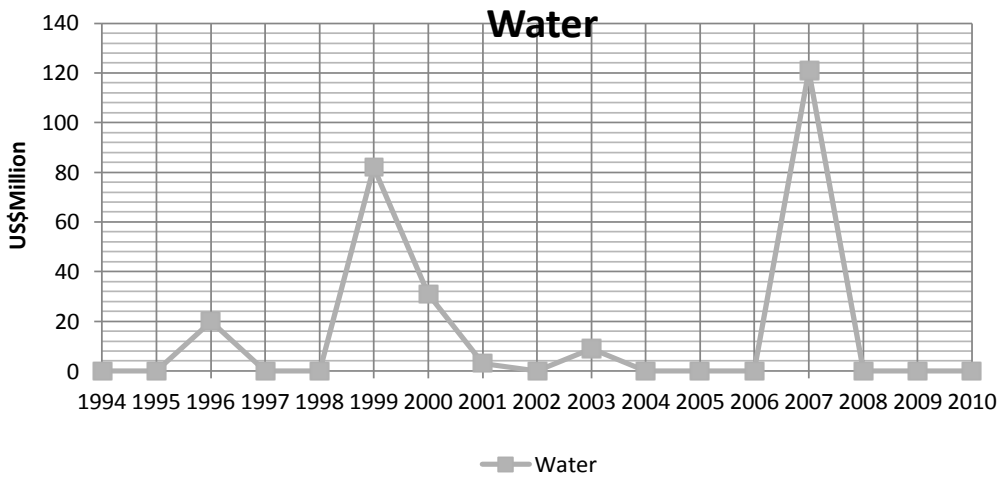

Figure 2. SSA Water PPI infrastructure investment (1994-2010).
Source: Based on data from PPI project database (www.ppi.worldbank.org).
Note: Figures on the left vertical are for water, and figures on the right vertical axis are for total PPI.

Table 4. SSA PPI investment projects by sector (1990-2010).

	Project type	No. of projects	Amount (US$ billion)
Energy		112	10.4
	Concession	17	1.9
	Divestiture	8	1.3
	Greendfield	60	6.4
	Management and Lease	17	0.005
Telecom		177	85.6
	Divestiture	28	19.3
	Greendfield	137	54
	Management and Lease	2	0
Transport		92	12.2
	Concession	56	6.9
	Divestiture	3	0.16
	Greendfield	14	4.7
	Management and Lease	14	0.04
WSS (22)		26	0.266
	Concession	2	0.076
	Greendfield	2	0.133
	Management and Lease	22	0.057

Source: Based on data from PPI project database (www.ppi.worldbank.org).

value of about US$12.2 billion. Regardless of the size of the projects, it is apparent that the ICT sector has continued to attract the largest share of private sector finances, while the WSS receives little or nothing from private investors.

Available data show that the largest share of investment in WSS infrastructure has come from public sources, particularly domestic government budget and bilateral donors[6]. When PPI investments in WSS sector are

[6] Domestic capacity to generate infrastructure funding resources vary across the region. In their study of 24 SSA countries, Irving & Manroth (2009:5) distinguish 3 countries (Nigeria, Chad and Namibia)as having high potential to generate domestic funds for infrastructure finance, 8 countries as having solid potential, 7 countries are seen to have limited potential and 6 countries are said to have severely limited potential.

Table 5. SSA private and public infrastructure funding by sector (US$billion).

Year		WSS	Energy	ICT	Transport	Total
2006	PPI	0.00	1.36	6.89	4.25	12.50
	Public	1.80	2.40	0.50	3.20	7.90
	PPI % of total	0.00	36.15	93.24	57.05	
2007	PPI	0.12	8.84	9.48	0.21	18.65
	Public	2.90	3.90	0.50	3.60	10.90
	PPI % of total	4.01	69.39	94.99	5.39	
2008	PPI	0.00	0.55	11.73	1.26	13.54
	Public	2.60	3.60	0.30	5.90	12.40
	PPI % of total	0.00	13.17	97.51	17.60	
2009	PPI	0.00	0.32	11.32	0.42	12.06
	Public	2.20	6.70	0.70	7.50	17.10
	PPI % of total	0.00	4.52	94.18	5.34	
2010	PPI	0.00	0.37	11.90	0.25	12.52
	Public	3.80	12.90	0.30	6.90	23.90
	PPI % of total	0.00	2.79	97.54	3.50	

Source: Author based on data from ICA(2011) and PPIAF database (www.ppi.worldbank.org). Note: WSS=Water and Sanitation Services. PPI=Private Participation in Infrastructure. ICT= Information and Communication Technology. PPI are partnership between public and private sector in the form of PPP. Thus, PPI figures include public funds allocated to the PPP protects

compared with the contributions from donors and public sources in the period 1994 to 2004, it becomes overwhelmingly clear that the bulk of the funding has been coming from public sources[7]. While projects in which the private sector participated in SSA contributed an average of only 2.1% of the total infra-structure investments for water services between 1994 and 2004, the average PPI contribution was over 95% for telecommunication, more than 47% for energy and over 16% for transport over the same period (ICA, 2006). This trend has continued up to the present moment as Table 5 shows.

Between 2006 and 2010, while PPI investments in ICT accounted for over 95% of total investment to the sector on average, PPI share in the WSS investment averages only less 1% over the same period.

Factors accounting for low PPI investment in WSS

There are several factors which account for the low private sector participation in WSS infrastructure investment in SSA. On the side of the state, water services carry political sensitivities which often prevent operating water services as a full-blown commercial entity. Because of the political and social sensitivity surrounding water services, many governments have been reluctant to fully divest water services; the state has always maintained a certain level of control, especially of infrastructure development and. Sensitivities around raising tariffs to full cost recovery level, plus a profit margin (which a private operate would normally to do) have proved to be politically explosive in many cases (Alves, 2011). Thus, the private sector's participation in the WSS sector has always been a heavily guarded undertaking, often leading to political interference, especially in the setting of water tariffs.

On the side of the private investors, one important factor accounting for the low private sector investments in the water supply infrastructure is that WSS is often perceived as a high risk sector with low prospects of breaking even. The few private investors participating in water supply services are restricting investments to management or services operations which carry low risks as noted earlier. Since the mid-1990s, the private sector has been pushing riskier investment activities to governments and other public financial institutions

[7] This includes government, donors and multilateral lending institutions. Major public sector funding sources for infrastructure development are multilateral and bilateral donor agencies who channel their funds mainly through governments in the form of grants (mainly project assistance) and concessional lending (loans below-market rates).

(Swyngedouw, 2005). According to the World Bank, private sector investors are demanding that donors and IFIs cover all risks not directly related to operations, including currency, regulatory, payment, sub-sovereign and affordability risks (World Bank, 2003).

One of the major risks associated with WSS is the fact that water services are likely to be subjected to political interference, especially the setting of water tariffs, which in turn impact on profit margins. Other than the risk of political interference, it is also widely believed that water services are susceptible to other risks such as consumers defaulting on their bills, community protests and illegal connections, risks which investors in other sectors such as ICT and transport do not have to worry about. There is a strong perception among private financiers that in addition to water services being susceptible to all these risks, water services infrastructure requires large capital outlay and longer payback periods Chan et al., 2009). Thus, a purely business investment analysis often leads to the conclusion that WSS is not a profitably viable sector, especially in low income countries. This has led some analysts to conclude that "from the project finance point of view, there are not enough bankable projects in WSS in Afirca" (Banerjee et al., 2008b). These views are increasingly making it difficult to attract private finance into water services, with many potential investors shrugging off any suggestion of investing in water services:

Talk to infrastructure investors about the water sector in Africa and the response may be something akin to a sigh or a shrug of the shoulders. For reasons for humanity as much as for profit, they would much rather there was a stronger prospect for success. Some will refer to the odd project that came across their desk that looked interesting but which they eventually passed on; many will say the challenges are just too great to allow them much hope of investing at this point (Alves, 2011).

Given these persisting views among private investors, it is unlikely that private finance will be a major source of infrastructure investment, especially in poorer countries of SSA. For some potential investors, the water tariffs in SSA are very low such that internally generated revenue is not sufficient to cover even the operating costs, a situation worsened by high production costs and low income levels for majority of households. From the private investor's point of view analysis, it does not make commercial sense to invest in WSS in poor countries, and the outlook continues to be negative, especially in poorer countries and cities where most households without services are located.

Profile of selected water utilities in Africa

An assessment of the prospects of attracting private capital investment in WSS in SSA has to consider the current performance and context in which water utilities operate. In this section, the profile of selected water utilities is presented. One of the main challenges that is evident is the absence of credible, up to date and comparable data. In some cases it is even difficult to establish the proportion of people with access to safe water. Although recent efforts by the IBNET as well as the AICD to improve the quality of data is a step in the right direction, the challenges of data quality, scope and availability still remain.

Contrary to common perception that most water utilities in SSA are not able to meet O & M costs from user charges (Komives et al., 2005), available evidence suggests that, on average, utilities in most African countries are managing to cover their O&M costs from their internally generated revenue. As Table 6 shows, the operation cost coverage ratio (OCCR)[8] for utilities in most countries, except for Mozambique, Togo, Tanzania, South Africa and Zambia, has been above 1 since 2005, suggesting that these utilities are able to cover O&M costs from water tariffs. The OCCR in most of the selected countries compares well with the global median of 1.05 in 2008 (van den Berg and Danilenko, 2011), and a number of utilities have an OCCR of 1.3 which is the international benchmark for full cost recovery (Banerjee and Morella, 2011).

While for most utilities, revenue from water charges is far from the full cost recovery level, being able to meet O&M from internal resources has been a significant improvement when compared to where most of these utilities where a decade ago. However, it must be noted that most of the utilities in Table 6 operate in urban areas where household income is generally higher (van den Berg and Danilenko, 2011), making it possible to generate higher revenue through user chargers. Rural areas and peri-urban communities where household income is low are often neglected by most of the utilities (Chitonge, 2011). Even if the figures in Table 6 reflect the urban situation only, it is also evident that most utilities are far from full cost recovery, which includes capital expenditure costs. The average revenue per unit of water produced *vis a vis* the cost of producing the unit of water is lower than what is needed to cover capital expenditure which requires, at least, the tariff to be twice the average O&M cost (Foster and Yepes, 2006).

But, the failure to cover the full cost of providing water services (including capital costs) is not a phenomenon unique to utilities in SSA. A survey covering 132 water utilities in different countries by Global Water Intelligence (GWI, 2004) suggests that up to 89% of utilities in low

[8] OCCR is a basic indicator of a utility's ability to cover basic operation costs from internal revenue. It is a ratio of the average cost of producing one unit of water to the average revenue per unit of water. An OCCR greater 1 indicates that a utility is able to cover operation costs without relying on external subsidies while an OCCR value below 1 suggests that the utility's internally generated revenue (mainly from water service chargers) is not sufficient to cover O&M costs. However OCCR does not include depreciation cost, amortized capital, rehabilitation and replacement costs (see Joffe et a, 2008; van den Berg & Danilenko, 2011)

Table 6. Profile of utilities in selected SSA countries.

Single utilities						Average for more than 1 utility					
Country	**O$M (US$/m^3)**	**Av.tariff (US$/m^3)**	**OCCR**	**NRW**	**Collection**	**Country**	**O$M (US$/m^3)**	**Av.Tariff (US$/m^3)**	**OCCR**	**NRW**	**Collection**
Benin						**Ethiopia (6 utilities)**					
2005	..	..	..	..	..	2005	0.27	1.02	3.78	35	29
2006	..	..	..	..	..	2006	0.2	0.42	2.10	39	97
2007	0.74	1.17	1.58	28	100	2007	0.14	0.39	2.79	38	102
2008	0.78	1.28	1.64	24	93	2008	0.18	0.42	2.33	41	93
2009	0.7	1.37	1.96	28	91	2009	0.15	0.31	2.07	39	104
Burkina						**Kenya (7 utilities)**					
2005	1.3	1.04	0.80	23	95	2005	0.22	0.32	1.45	36	137
2006	0.69	1.43	2.07	18	105	2006	0.25	0.48	1.92	49	113
2007	0.73	1.57	2.15	18		2007	..	..		..	
2008	0.86	1.89	2.20	18		2008	..	..		..	
2009	0.81	1.67	2.06	18		2009	0.6	0.57	0.95	43	84
Ghana						**Mozambique (5 utilities)**					
2005	0.53	0.6	1.13	53	..	2005	0.77	0.55	0.71	58	80
2006	0.65	0.58	0.89	53	96	2006	0.67	0.57	0.85	56	73
2007	0.61	0.74	1.21	52	90	2007	0.85	0.69	0.81	59	85
2008	0.76	0.87	1.14	52	91	2008	..	..	..	..	..
2009	0.54	0.63	1.17	52	79	2009	..	..	..	..	..
Lesotho						**Namibia (3 Utilities)**					
2005	0.7	0.84	1.20	39.4	..	2005	2.05	1.85	0.90	15	..
2006	0.71	0.8	1.13	39.2	..	2006	1.64	2.18	1.33	17	73..
2007	0.79	0.96	1.22	42.6	..	2007	1.64	2.23	1.36	15	..71
2008	0.85	0.88	1.04	39.5	..	2008	1.44	2.05	1.42	17	..69
2009	0.89	0.9	1.01	40.2	..	2009	1.49	2.2	1.48	14	..69
Malawi						**Nigeria (12 utilities)**					
2005	0.16	0.26	1.63	24	91	2005	0.14	0.2	1.43	50	..
2006	0.54	0.5	0.93	31	51	2006	0.06	0.13	2.17	22	82
2007	0.53	0.56	1.06	40	68	2007	0.07	0.15	2.14	21	55
2008	0.63	0.62	0.98	36	83	2008	0.09	0.18	2.00	22	78
2009	0.47	0.56	1.20	40	86	2009	0.09	0.24	2.67	23	84
Mali						**RSA (15 utilities)**					
2005	0.3	0.56	1.87	27	..	2005	1.22	1.09	0.89	30	74
2006	0.32	0.61	1.91	25	99	2006	1.18	1.06	0.90	28	79
2007	0.33	0.64	1.94	26	100	2007	1.28	1.15	0.90	32	97
2008	0.34	0.75	2.21	26	96	2008	1.27	1.21	0.95	37	98
2009	0.33	0.65	1.97	27	99	2009	1.41	1.26	0.89	37	100
Niger						**Tanzania (20)**					
2005	0.42	0.54	1.29	19	..	2005	0.32	0.27	0.84	41	..
2006	0.45	0.52	1.16	17	97	2006	0.28	0.28	1.00	41	103
2007	0.43	0.55	1.28	17	90	2007	0.4	0.35	0.88	45	88
2008	0.48	0.64	1.33	15	92	2008	0.29	0.24	0.83	36	97
2009	0.47	0.58	1.23	16	87	2009	0.44	0.39	0.89	46	103

Table 6. Contd.

Senegal						**Zambia (10 utilities)**					
2005	0.63	0.81	1.29	43	98	2005*	0.23	0.2	0.87	45	79
2006	0.4	1	2.50	20	94	2006*	0.28	0.22	0.79	45	81
2007	0.44	1.15	2.61	20	90	2007	0.27	0.33	1.22	46	83
2008	0.55	1.4	2.55	21	94	2008	0.38	0.44	1.16	45	91
2009	0.51	1.25	2.45	21	94	2009	0.28	0.33	1.18	45	76
Swaziland						**Togo**					
2005*	1.49	1.44	0.97	39	..	2005	0.96	0.65	0.68	28	54
2006	1.47	1.39	0.95	39	96	2006	1.55	0.66	0.43	19	89
2007	1.66	1.39	0.84	39	96	2007	1.6	0.7	0.44	15	88
2008	1.33	1.4	1.05	40	99	2008	2.02	0.81	0.40	16	98
2009	1.48	1.56	1.05	37	97	2009	1.57	0.71	0.45	15	91

Source: Author based on data from IBNET database (www.ibnet.org). NRW= non-revenue water; Tariff = average tariff; O&M= operation and maintenance costs; OCCR=operation cost coverage ratio; Collection= collection ratio of billed water. Note: Average tariff reflects the mean tariff for the different tariff bands such as industrial, government institutions, domestic and the different tariffs for various blocks of users.

income countries and 39% in upper middle income countries are unable to cover O&M costs from water tariffs. Data collected by the IBNET from more than 2600 water service providers in 110 countries show that "even in the best of times the median utility barely covers its operation and maintenance costs, leaving it without the capacity to replace worn-out assets let alone expand services to larger groups of consumers" (van den Berg and Danilenko, 2011). Some estimates suggest that only 50% of utilities in high income countries have tariffs adequate to cover partial capital costs (Komives et al., 2005). In the same IBNET dataset, it is observed that the "proportion of utilities unable to cover their basic operation and maintenance costs has increased from 35% in 2000 to 43% in 2008, with most of that increase occurring since the fuel crisis hit the sector" (ibid).

Nonetheless, while it is true that most utilities in low income countries cannot even cover their O&M costs, the failure to cover basic operation and maintenance costs is not just a matter of water tariffs being too low. Other factors such as high non-revenue water (NRW), over staffing, low collection efficiency, low production volumes, small size of the network[9] and unpaid bills by government institutions affect levels of internal revenue. In fact, studies are now showing that the African cost of services such as water, energy, telephone and services is highest among developing countries (Banerjee and Morella, 2011). Thus, raising the tariff levels, in most of the unities, will not solve the problem of inadequate internal revenue; this would require addressing both the technical as well as management operation systems to improve efficiency and reduce production costs. For such improvements to be effected, massive infrastructure expansion and replacement is required in many utilities.

While there have been suggestions to increase water tariffs to full cost recovery levels (Joffe et al., 2008), the challenge of inadequate internal revenue from water charges is not entirely a function of low tariffs for most utilities in Africa. As shown in Table 7, tariffs in the selected utilities are already relatively high. Except for utilities in Kenya, Ethiopia, Tunisia and Zambia, the average tariff for utilities in the selected countries fall within the tariff band regarded as sufficient to cover operation and maintenance costs and partial capital costs in low income countries (GWI, 2004; Komives et al., 2005; Foster and Yepes, 2006; van den Berg and Danilenko, 2011).

Most utilities in the selected countries, however, when compared to past performance, reflect a huge improvement towards meeting basic operation costs. Collection efficiency and other technical performance indicators are showing signs of improvement, though huge challenges remain around NRW which is very high in many countries (Torres, 2012). For some countries, up to half of the total processed (treated) water is not billed for various reasons including billing errors due to unupdated customer database, leakages, illegal connections, non-payment of water bills and bad debts.

Thus, suggestions that on average water tariff in some African utilities should increase by 75% to be sustainable (GCR, 2008 as cited in Joffe et al.,) ignore the fact that water tariffs in many African countries are already relatively high, mainly driven by high production

[9] A study conducted in Latin America suggests that smaller networks of less than 100 000 connections and lower production volumes find it difficult to operate efficiently (see Foster, 2005). Other studies have also suggested that increasing production volume and size of the network up to a certain level can significantly reduce operation costs per unit (see GCR, 2008). .

Table 7. Tariff and cost coverage ratio for selected utilities.

Utility	Country	O&Mcost/m3	Ave tariff US$/m^3	OCCR
NWASCO**	Kenya	0.16	0.42	2.60
NCWSC*	Kenya	0.40	0.41	1.03
NWSC*	Uganda	0.71	0.74	1.04
ONEA*	Burkina Faso	0.64	1.00	1.63
SDE*	Senegal	1.04	1.01	0.97
SONDE*	Tunisia	0.35	0.44	1.26
LWSC**	Zambia	0.26	0.28	1.08
NWSC**	Zambia	0.19	0.26	1.37
A Maputo**	Mozambique	0.73	0.58	0.80
Windhoek**	Namibia	2.08	1.34	0.86
LWB**	Malawi	0.23	0.65	2.83
Johannesburg**	RSA	1.49	1.37	0.92
Adam**	Ethiopia	0.32	0.34	1.07
BWB**	Malawi	0.57	0.97	1.70
MWSA**	Tanzania	0.18	0.35	1.92
eThekwini**	RSA	1.55	1.15	0.74

Source: author based on Data from AICD database (2005) and Global Credit Rating (GCR, 2008). O&M= operation and maintenance costs; OCCR=operation cost coverage ratio; [*]=data from (GCR, 2008) figures for 2006; [**]=data from AICD database, figures for 2005.

costs due to poor and inadequate infrastructure. Recent estimates show that the price of services such as telephone, electricity, water and transport in Africa are "exceptionally high by global standards" (Foster, 2008). Perhaps what should be emphasized is not so much increasing the tariffs, but streamlining the operation systems to improve systems' efficiency which can lower operation costs. Evidently, operation costs are relatively high, especially in middle income countries such as South Africa and Namibia, resulting in higher tariffs, and yet insufficient to meet operation costs (Table 7). In the South African case, the free basic water policy[10] may account for the utilities' inability to cover operation costs from internal revenue since the calculation for average tariff is based on billed water. High operation costs in many countries are a reflection of technical inefficiencies mainly high labour costs, inappropriate technology, aging infrastructure and low collection efficiency. These cost components cannot be simply addressed by increasing water tariffs; they may require efficient and upgraded systems which is only possible with more capital investments.

Steep increases in the current tariff may result in widespread customer default which can endanger internal revenue for most utilities in the region. Tariffs in the water sector have to always factor in the affordability burden for domestic customers. Table 8 shows that using the affordability burden threshold of not more than 5% of monthly household expenditure as the benchmark majority of the countries even in urban areas where income levels are generally higher might experience problems paying for water.

Even if one considers the basic minimum consumption[11] of 6 m^3 per month, many countries will have large population finding it difficult to pay for water services. Estimates show that at 10m^3 per month per household, it is only in middle income countries such as South Africa and Namibia where the median household may not have difficulties paying for water; most of the countries would have the larger portion of households spending higher percentage of their expenditure on water services. A recent study in SSA reveals that if tariffs are set at full cost recovery of US$1 per 1m^3, a 10m^3 consumption per month per household would mean that only 40% of households in SSA would be able to afford water services without experiencing undue water tariff burden (Banerjee and Morella, 2011). Estimates in Table 8 may reflect even higher affordability burden if the rural population who tends to have lower income is included in the analysis.

What all this suggests is that the room for bankable water investments is very small in many countries under these circumstances, and with this outlook, private investors are likely to invest in other sectors which offer

[10] The South African government provides 6m^3 (6 kilo litre) of water per month per eligible household. Eligibility is means tested based on a household's monthly income.

[11] The World Health Organisation (WHO) recommends 20 l/capita/day as basic minimum water consumption for drinking and sanitation. In washing and other uses are included the 20l per day is far too low even for poorer household(Howard & Bartram, 2003).

Table 8. Water tariff and affordability for selected SSA countries 2009.

	Tariff (US$/m^3)	US$/ capita	Monthly/ cap	Cost @ 10m^3	Cost @ 6m^3	% share of 6m^3 in monthly/cap	% share of 10 m^3 in monthly/c	Coverage
Burkina	1.67	480	40.00	16.7	10.02	25.05	41.75	
Ethiopia	0.31	280	23.33	3.1	1.86	7.97	13.29	99
Ghana	0.63	630	52.50	6.3	3.78	7.20	12.00	79
Kenya	0.57	730	60.83	5.7	3.42	5.62	9.37	48
Malawi	0.56	280	23.33	5.6	3.36	14.40	24.00	86
Mozambique	0.69	380	31.67	6.9	4.14	13.07	21.79	34
Namibia	2.20	4210	350.83	22	13.2	3.76	6.27	100
Nigeria	0.24	1170	97.50	2.4	1.44	1.48	2.46	50
RSA	1.26	5820	485.00	12.6	7.56	1.56	2.60	78
Tanzania	0.39	440	36.67	3.9	2.34	6.38	10.64	83
Togo	0.71	410	34.17	7.1	4.26	12.47	20.78	91
Uganda	1.10	420	35.00	11	6.6	18.86	31.43	73
Zambia	0.33	950	79.17	3.3	1.98	2.50	4.17	75

Source: Author based on data from International Benchmarking Network Database (www.ibnet.org). Note: Tariff is the average tariff reported by the participating utilities converted to US dollars. In the absence of credible household income, a single GDP per capita (/capita) figures are often used as a proxy for household income (IBNET, 2011). In most low income countries, the monthly GDP per capita figures are equivalent to the national average household monthly income (Chitonge, 2011). In many countries, monthly GDP per capita is higher than the average monthly household income of the bottom three income quintile.

health profit margins. According to the UN Department of Economic and Social Affairs, for the "foreseeable future, private operators are more likely to be a source of managerial and technical know-how rather than investment in the water sector in developing countries" (DESA, 2004).

POLICY IMPLICATIONS AND RECOMMENDATION

From the above discussion, it is apparent that increasing investment in water services in SSA will require an innovative approach to the infrastructure funding gap challenge. Under current circumstances, the prospects of attracting private capital in WSS are extremely low, and available evidence suggests that private investors continue to forecast a negative outlook for WSS in SSA (Alves, 2011). Given this scenario, the view that private investments will cover the funding gap in WSS needs to be re-assessed on the basis of available evidence and realistic assessment of such investments. In the context of the current global investment trends and given the prevailing conditions in the WSS sector in many African countries, the scope for attracting private capital investment to the sector will continue to be minute, restricted probably to a few middle-income countries, such as South Africa, Namibia, Tunisia, Mauritius etc. While some analyst have argued that low private sector investment in WSS is an indication that more needs to be done to attract private investment (PwC, 2004; 5), under the prevailing conditions it is highly unlikely that private investors will be lured into water infrastructure financing, even by the most generous incentives. Thus, policy strategies for water infrastructure development in the region need to focus on mobilizing public resources and improving the allocation and utilization of the little available resources.

Coordinated funding strategy

It is also clear from the above discussion that water infrastructure in SSA receives the lowest funding both from private and public sources, when compared to other sectors in both relative and absolute terms. Evidently, private sector investments are concentrated in sectors

perceived to be less risky, with secure and larger profit margin. Since the telecom-munication sector (and to a large extent the transport sector) is attracting the bulk of private capital and at the moment there is no 'real' funding gap for ICT (Table 1), public resources should be directed more to sectors that are receiving little or no private investments, especially WSS and energy. Although, as noted above, public sources of infrastructure funding are the only resources going into WSS particularly, a more coordinated approa-ch to infrastructure funding will be needed to avoid creating an imbalanced infrastructure base. Having one sector with well developed infrastructure amidst a sea of underdeveloped infrastructure in other sectors can lead to underperformance of the sector with the most developed infrastructure. Thus, it is important that a more balanced approach to infrastructure development is adopted. This will ultimately require coordinating both private and public investment resources. Since the private sector has fragmented interest and focus, it is the public sector (at the national or regional level) that needs to take up the responsibility of coordinating infrastructure investments.

Efficient and effective use of resources

In order to close the existing funding gap in infrastructure development with the current available resources, it is imperative that the existing resources are utilized efficiently and effectively. Inefficient funding mechanisms manifested in the form of "excess expenditure" in some sectors and ineffective use of resources manifested by "under-spending" magnify the extent of the infrastructure gap. In the case of under-spending, it is estimated that the public sector can increase up to 30% of the resources available for investment, "by simply addressing the institutional bottlenecks that inhibit capital budget execution" (Foster and Briceno-Garmendia, 2010). Current estimates also suggest that addressing the problem of excess expenditurein some sectors can free resources of up to US$3.3 billion a year, while resolving the problem of under-spending can make available up to US$1.9 billion per year (ibid). While the fact that there are not enough resources for infrastructure investment in many countries should not be overlooked, it is important also to stress the fact that if the available resources are used efficiently and effectively, they can reduce the infrastructure gap significantly in the long-term.

Taking stock of infrastructure

Related to the issue of coordinating investment and resources in the region, is the question of data. All the major studies done on infrastructure investment in SSA have noted the challenges posed by lack of or poor quality data (Fay and Yepes, 2003; Estache, 2006; Estache and Giocoechea, 2005; Ayogu, 2006; Irving and Manroth, 2009). Most of the efforts at estimating the infrastructure stock in SSA have heavily relied on extrapolation, and this has not proved to be helpful. Lack of data on what is actually there and what is needed has contributed to the low priority given to the sector in public policy circles. In many instances the absence of data compromises both the policy, planning and resource allocation processes because "data gaps are currently exceptionally large in Africa. [And these] gaps boil down to asking sector policymakers in Africa to make blind decisions…'(Estache, 2005). In this regard, having an updated database of infrastructure inventory, with updated information on the size of the WSS, the current infrastructure gap, the projected growth in demand for services, expected investments, the number of people without services, the production capacity of existing infrastructure, etc should be the starting point for considering possible policy options. In most countries, information on many of these variables is not available and often not updated.

Harnessing local skills and initiatives

For one reason or another, in most developing countries, talking about private sector involvement is automatically equated to foreign private actors. Local skills, financial resources and initiatives are often over- looked. But experience in the water sector in SSA shows that there is a lot that can be mobilized locally. Certainly, the local financial and capital markets in most countries in SSA are underdeveloped with little capacity to provide the massive capital outlay needed in building infrastructure (Sheppard et al., 2006; Irving and Manroth, 2009), but there are various ways in which the little local resources and skill can be harnessed towards addressing the challenge of water services in the region. One area in which the local resources have played an important role is in the management of infrastructure and services as well as in providing independent regulation and monitoring of service providers. There are encouraging examples of local initiatives in the water sector in Uganda, Burkina Faso, Zambia, and now Kenya and Tanzania, where, with the support from public funds, the local management teams have helped to re-organize the sector.

Recent studies are showing that establishment of independent regulators that operate on the basis of performance contracts and regular audits of the utilities has contributed significantly to improving not just operation efficiency but service provision even in cases where there have been no additional financial resources (Banerjee and Morella, 2011). In these countries, management teams composed of local professionals have implemented reforms which are helping to improve not only the use of the little resources available, but are also looking at possible ways of making the services

sustainable in the long run. The reported improvements towards meeting O&M costs are largely a result of reforms initiated and managed by local professionals in many of these utilities. Therefore, development and mobilization of local resources including capital investments should be part of the coordinated strategy that aims at using these resources more effectively to meet the current challenges. Similarly, with regard to capital investments, even if the local financial and capital markets are not developed, there are reports of local water operators who are financing these small water projects in smaller towns from local sources. Such initiatives need to be explored to determine whether they can be viable means of overcoming the existing funding gap.

Conclusion

Infrastructure investment remains one of the major challenges for SSA. While all infrastructure investment flows are inadequate in most sectors, the water supply sector is the most affected. Unlike ICT, the WSS sector since the 1994 has attracted insignificant proportions of private capital investment and the situation has not shown any signs of improvements in the last five years. From 1994 up to 2012, the sector has only received US$266 million from private sources, representing less than 0.2% of total PPI. Assessment of the current WSS context suggests that the prospects for significant private investments into WSS sector for low income countries in SSA are extremely low. The largest proportion of investment into WSS will continue to come from public sources. In view of this, the initial assumption that the private sector would provide the much needed capital investments in the sector needs be re-assessed.

Changing private sector investment patterns, low prospects for profits, declining donor aid (Ashley and Cashman, 2006), high risks and political and social sensitivities associated with the water services worsen the prospect of attracting private investment into the sector in many SSA countries. The room for steep tariff increase which can attract private investors is very small, given that most tariffs are already within the range regarded as sufficient to cover basic operation costs and partial capital expenditure. Thus, tariff increases are not going to solve the problem of insufficient internal revenue for water utilities. This presents a major challenge for many countries in the region given the low levels of access to water and sanitation among the people and the lack of capacity for the public sector to mobilize sufficient capital investment to meet the needs.

In order to respond to these challenges, effective co-ordination and innovative infrastructure finding approaches need to be explored. Public agents in the infrastructure sector should provide the leadership in coordinating infrastructure investment from various public sources. Such efforts should be complemented by mobilizing local resources, skills and initiatives to ensure sustainability and improved access to services.

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