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## Financing Water in Africa

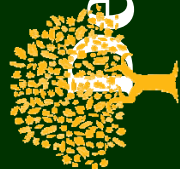
by

**Kate Bayliss**

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Department of Economics  
School of Oriental and African Studies  
London, WC1H 0XG  
Phone: + 44 (0)20 7898 4730  
Fax: 020 7898 4759  
E-mail: [economics@soas.ac.uk](mailto:economics@soas.ac.uk)  
<http://www.soas.ac.uk/economics/>

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# Financing Water in Africa

Kate Bayliss<sup>1</sup>

## **Abstract**

Despite repeated policy initiatives from donors and governments, the human and economic cost of continued lack of access to safe water and sanitation in sub-Saharan Africa remains high. This paper shows that a radical reorientation of policy is needed to achieve a significant increase in investment finance in order to raise access levels. Rather than continuing to pursue policies that have failed for the past two decades, such as bringing in the private sector and raising prices to cost recovery levels, attention needs to shift to wider aspects of domestic revenue mobilization to support public investment.

**Keywords:** Water, privatisation, private sector participation, PPP, cost recovery, pricing, equity, inequality

**JEL classification:** D40, L95, H1, H2, H4

<sup>1</sup> Department of Economics, School of Oriental and African Studies: [kb6@soas.ac.uk](mailto:kb6@soas.ac.uk)

## 1 Introduction

Despite decades of effort and numerous international, regional and national high-level political commitments to improving coverage, still, around 333 million people do not have access to safe water sources in sub-Saharan Africa (SSA) and nearly 600 million lack access to sanitation facilities. While, overall, the percentage of the population with access has risen since 1990, this has mainly been in rural areas. Growing population pressures in urban areas means that the number of people without safe water and sanitation in towns and cities has doubled since 1990 (JMP 2012). The human and economic cost of this deprivation remains high. For example, lack of access to water and sanitation costs African countries up to 6% of their GDP each year and poor sanitation is the biggest killer of children in Africa (WaterAid 2011).

During the 1990s, infrastructure was generally neglected as many donors shifted their priorities to social interventions (Foster and Briceño-Garmendia 2010) and infrastructure did not feature strongly in the formulation of the Millennium Development Goals (MDGs) (Scott and Seth 2012).<sup>2</sup> More recently infrastructure has attracted greater attention with emphasis on the need for investment which is often denoted in terms of a “financing gap”. Finance is increasingly the frame of analysis in considering infrastructure shortfalls.

Achieving financial sustainability in water supply and sanitation (WSS) has been one of the most stubborn development objectives for the World Bank and has been a policy goal for more than three decades (McPhail et al 2012). While there has been some tweaking, the essence of the policy approach to water finance has also changed little over the period. Since the early 1990s, policies have consisted of variations on the following three themes: improving efficiency, recovering a higher proportion of costs from end users and attracting more private sector investment.

This paper suggests that the on-going stalemate in water finance can only be addressed by a major reorientation of sector policy away from the current neoliberal agenda. Conducting a critical assessment of two key elements of the orthodox approach – attracting private investment and raising prices to cost recovery levels - the paper shows that neither of these avenues for raising revenue is likely have much impact on the infrastructure financing gap. Rather, increasing public investment is the only viable and equitable way to increase infrastructure investment. This is based on historical precedent and indications that considerable potential exists to increase revenue mobilisation in the region. This conclusion contrasts with the policy positions of most donors and governments who repeatedly fail to connect infrastructure development with the state’s macro-level, revenue-raising mandate via taxation.

<sup>2</sup> In the development of the post-2015 agenda, the importance of infrastructure in underpinning many of the Goals has been recognized but it is not clear that this will translate into explicit targets for infrastructure in the future (Vandemoortele 2012, UN 2012).

The paper is structured as follows. The following section outlines the main sources of infrastructure finance in SSA and the extent and nature of the financing gap. This is followed by a review of the policies currently being promoted to raise finance for infrastructure including leveraging of private funds and increasing tariffs and goes on to show that tariffs in Africa, relative to incomes are very high when compared with global trends. The paper shows that a far more promising source of revenue for infrastructure investment comes via the public sector. Currently large volumes of revenue are lost through capital flight and ineffective tax incentives. Taxation of extractive industries can be better harnessed to support infrastructure development. Unlike the options proposed by international financial institutions (IFIs), raising revenue via the state offers potentially greater equity of outcomes.

## **2 The financing gap**

The economic benefits from investment in infrastructure outweigh the cost. The OECD cites evidence to show that each dollar invested in water supply and sanitation (WSS) generates between US\$4-12 in health benefits alone, depending on the type of water and sanitation service (OECD 2009 – citing WHO 2008). There are further advantages in terms of education, gender equity and economic activity. Even though these facts and factors are widely acknowledged, infrastructure investment in Africa is not sufficient and the deficit is costly. In Africa the infrastructure shortfall is lowering economic growth by 2% per year and reducing the productivity of firms by as much as 40% (UNECA 2012, p.115).

To address the need for investment, the Infrastructure Consortium for Africa (ICA) was established at the G8 meeting in Gleneagles in 2005 to focus on scaling up donor finance to meet Africa's infrastructure needs. However, it soon became clear that scaling up was constrained by the inadequacy of even the most basic data on the quantity and quality of existing infrastructure. Hence, the ICA organized a research programme known as the Africa Infrastructure Country Diagnostic (AICD) to improve knowledge of the infrastructure sectors. The World Bank was commissioned to undertake the study. The initial project covered 24 countries in Africa and set out in great detail the state of existing infrastructure as well as the costs involved in raising services to MDG-equivalent levels. A flagship Report was published in 2010 (Foster and Briceño-Garmendia 2010). A second phase of the AICD is known as the Africa Infrastructure Knowledge Programme (AIKP) and is intended to generate data on infrastructure on a regular and sustainable basis, extending coverage to all countries in the region. This is housed within the African Development Bank.<sup>3</sup> The AICD and AIKP are, therefore, relevant for the whole region.

Table 1 shows the results from the AICD review. In total, Africa needs to spend about US\$93.3bn a year on infrastructure and existing spending is around half that. The biggest shortages are in electricity and WSS. It is estimated that for water, the cost of achieving the MDG-level coverage is around \$16.5bn a year. Current spending is \$3.6bn (Foster and Briceño-Garmendia 2010).

<sup>3</sup> Africa Infrastructure Knowledge Program, Bulletin No.1, March 2011

**Table 1: Infrastructure finance and the funding gap**

	Electricity	ICT	Irrigation	Transport	WSS	Total
Spending needs	40.8	9.0	3.4	18.2	21.9	93.3
Existing spending	11.6	9.0	0.9	16.2	7.6	45.3
Efficiency gains	6.0	1.3	0.1	3.8	2.9	14.1
Remaining gap	23.2	-1.3	2.4	-1.8	11.4	33.9

Source: Foster and Briceño-Garmendia (2010)

How, then, can this financing gap be filled? Foster and Briceño-Garmendia (2010) calculate that an additional US\$17.4bn could be raised “within the existing resource envelope” with US\$3.3bn from reallocating spending to the subsectors most in need and US\$14.1bn from improving management. An important element in the AICD country study reports (see references) is the calculation of what they term “hidden costs”. This is a monetary value that is attributed to “operational inefficiencies” which are mispricing, unaccounted-for losses and under-collection of bills. These costs are considered hidden as they are not explicitly captured by the financial flows of the operator (Dominguez-Torres and Briceño-Garmendia 2011a, p. 29, Box 3, citing Briceño-Garmendia, Smits and Foster 2009). A tariff below the cost-recovery level is considered as a source of inefficiency in the same way as leakages and revenue collection. But the implications are very different and are discussed in detail below.

Even if the proposed “efficiency gains” are achieved, a considerable financing gap of around US\$30bn a year remains. The largest relate to energy and water. Table 2 shows the main sources of funding for infrastructure as a whole and for water.

**Table 2: Expenditure of main infrastructure funders SSA**

	O&M	Capital Expenditure						
	Public Sector	Public Sector	ODA	Non-OECD	Private	H/h self-finance	Total Capex	Total Expenditure
Infrastructure	20.4	9.4	3.6	2.5	9.4	-	24.9	45.3
Water	3.06	1.06	1.23	0.16	0.01	2.13	4.58	7.64

Source: Foster and Briceño-Garmendia 2010

Considering each of the current sources of finance in turn, domestic public expenditure is the largest source of funding. However, Foster and Briceño-Garmendia (2010, p.75) consider that “it presents little scope for an increase, except possibly in countries enjoying natural resource windfalls”. Increasing domestic tax revenue “would require undertaking challenging institutional reforms to increase the effectiveness of revenue collection and broaden the tax base. Without such reforms, domestic revenue generation will remain weak” (Foster and Briceño-Garmendia 2010, p.76).

In Africa, ODA is a major source of finance for water and sanitation infrastructure, accounting for between 60% and 83% of the total capital expenditure (EUWI 2012). However, aid is not well targeted. The top ten aid recipients over the past decades are in most cases not the poorest countries (van Ginneken et al 2012, WaterAid 2011).

Non-OECD finance has increased in the region. In 2010, China became the strongest bilateral donor for African infrastructure and is continuing to lead. China’s commitments were estimated to reach about \$14.9bn in 2011, an increase of 66% compared to the previous year. However, Chinese investment is still limited in terms of sectors and destinations. More than 80% of Chinese infrastructure financing is directed toward the transport sector, followed by the energy sector with a share of 13% (ICA 2012). Nearly 70% of the country’s infrastructure financing in Africa is reportedly concentrated in four countries (Angola, Nigeria, Ethiopia and Sudan) (Mwase and Yang 2012).

Of the total private investment of US\$11.39bn, little has been directed towards WSS while 79% went to telecoms, 13% to energy and 7% to transport. In addition, private investment volumes have declined, falling by 17% in 2011 (ICA 2012). Domestic capital markets so far have contributed little to infrastructure finance outside South Africa. According to Foster and Briceño-Garmendia (2010), local capital markets offer the possibility of finance in the medium term with a growing number of corporate bonds issued by infrastructure companies in the region. However, raising bond finance for infrastructure requires a strong government role (Mbeng and Hunal 2013). Given the challenges in raising additional finance for infrastructure, the authors of the AICD flagship report favour improving management as a first step towards reducing the financing gap.

A similar line of argument is observed in the African Development Bank’s (AfDB) Programme for Infrastructure Development in Africa (PIDA). According to PIDA’s Priority Action Plan there is a financing gap for infrastructure in the region of over US\$30bn by 2020.<sup>4</sup> In considering alternative revenue sources, ODA is not considered to be a reliable source for a coherent funding strategy. Governments have to raise their own funds but this is limited to infrastructure bonds loan guarantees and regional country membership levies (UNECA/AUC 2012).

<sup>4</sup> PIDA is a programme dedicated to the facilitation of continental integration in Africa through improved regional infrastructure. It is a joint initiative of the African Union Commission (AUC), the New Partnership for Africa’s Development Planning and Coordination Agency (NPCA), and the African Development Bank (AfDB).

Finance is also considered to be a key constraint on infrastructure development in the United Nations ECA Economic Report on Africa. The report recommends harnessing the domestic financial sector such as commercial banks, insurance funds, stock market and pension funds. Further, African central banks are advised to introduce incentive-based risk-sharing and to issue bonds, launch guarantee schemes, and adopt new financial instruments to lever their balance sheets. Domestic efforts should be complemented by attempting to attract FDI from emerging economies and governments should take steps to get more out of existing infrastructure through efficiency gains (UNECA 2012).

The above provides an outline of the approach to the financing gap adopted by donors and government. There are different emphases, for example on the relative roles of domestic capital markets but, largely, policies come down to improving efficiency and attracting private investment. Increasing domestic revenue generation to finance public investment is not mentioned— even though most finance currently is from the public sector and most infrastructure development world-wide has been supported by the state.

### **3 Support for the private sector**

Engaging the private sector in water and sanitation in SSA has been challenging. Privatization has often been difficult to achieve and maintain. Private firms have contributed next to nothing in infrastructure finance and there is little evidence of efficiency gains. However engagement of the private sector remains at the heart of policy. This is in keeping with findings elsewhere. For example, Kindornay and Reilly-King, (2013, p.1) in their review of policy across 23 bilateral donors, described the private sector as “the new donor darling”.

The cancellation rate of private sector contracts for water supply in SSA has been much higher than in other developing countries. Approximately 29% of private contracts have been terminated prematurely. As a result, just a handful of private operators are still active (Banerjee and Morella 2011, p.87). Furthermore, just to achieve privatization, let alone have the contracts sustained, is beyond some countries, despite extensive efforts. In May 2010, the bidding for a management contract the World Bank’s water project in DR Congo failed to attract any bids from professional operators (PPIAF 2011a).

Following a detailed assessment of the impact of privatization in WSS Marin (2009) finds that, despite efforts to privatize, investment in water still comes primarily from the public sector. Rather than seeing this as a failing of privatization, he proposes a “hybrid” model where finance should come from a source other than the private enterprise including government and donor finance. In part this is because the private sector will raise efficiency. But here the evidence is far from clear. There are major empirical challenges in evaluating comparative performance and often the benefits derived from donor and government financing are attributed to privatisation (see Bayliss 2011). Public and private water companies are both among the best and the worst performing utilities. Effective regulation has been difficult to achieve. The private sector is portrayed as benign but there is evidence of substantial private profits possibly obtained by dubious means, such as transfer pricing, although information is difficult to obtain. For example in Mali, a big increase in labour costs



after water privatization was found to be due to payments to expatriate staff with inflated payments to the parent company (Estache and Grifell-Tatje 2013).

Despite these setbacks, support for the private sector to reduce the financing gap remains high, for example with donor initiatives such as the IFC, InfraCO, PIDG and Amcow. There have been numerous recent articulations of the need for private sector involvement in WSS delivery in the region. For example, at the 10<sup>th</sup> African Forum for Utility Regulators (AFUR) in April 2013, according to IFC Director Yolande Duhem, in order to increase coverage of safe water and sanitation, “national governments must promote and harness the private sector to deliver high-quality affordable sustainable services”. This message was echoed by members of the Tanzanian government at the same meeting. For example, the Tanzanian Water Minister Jumanne Maghembe commented on the reluctance of the private sector to invest in water: “Huge capital, low rate of return, long payback period and lack of guarantee for cash flows for investments made are among the factors scaring away investors in the sector”, but he still maintains that “PPPs remain an appropriate model for water and sanitation in Africa”. At the same meeting, the Tanzanian Vice President Dr. Mohammed Bilal called for a more “conducive environment” for the private sector which “assures sustainability and promises reasonable return on investment in the sector”.<sup>5</sup>

In an international conference in Dakar in June 2012, Mr Jering Sallow, Director of the AfDB’s Water and Sanitation Department stated that public finance is not enough to meet Africa’s growing need for better water and sanitation and that private funding must also play its part. According to Sallow, “As public sector funds are insufficient to cover resource requirements, there is a need for collaboration and strong involvement of the private sector as implementers, financiers and providers of services”.<sup>6</sup> Similarly, according to the Concept Note of the Africa High Level Forum on Water and Sanitation for All held in Dakar in December 2012: “Without a doubt, fulfilling these commitments will require effective coordination between governments, donors/financial and development partners, civil society and private sector to ensure increased prioritization and allocation of financing for the sector; including a paradigm shift in financing mechanisms from aid to investments from the Private Sector”.

Clearly, support for private sector involvement remains strong, despite little evidence that it has had much positive impact. However, the difficulties that have emerged have led to calls for innovation in private financing mechanisms. (OECD 2010). Much attention has been focused on the notion of “leveraging” which is presented as a means by which limited public sector funds can be stretched further. According to a recent World Bank report (Rodriguez et al 2012), there is a need to shift the burden of infrastructure finance from the public sector to shared investment by the public and private sector. By using public funds to “leverage” private finance, donors and governments can take steps to “jump start” private

<sup>5</sup> [http://www.ooskanews.com/daily-water-briefing/water-sector-ppps-struggling-sub-saharan-africa\\_27248](http://www.ooskanews.com/daily-water-briefing/water-sector-ppps-struggling-sub-saharan-africa_27248)

<sup>6</sup> [www.afdb.org/en/news-and-events/article/afdb-hails-public-private-partnerships-as-major-aid-to-african-water-and-sanitation-9396/](http://www.afdb.org/en/news-and-events/article/afdb-hails-public-private-partnerships-as-major-aid-to-african-water-and-sanitation-9396/)

finance in water (Rodriguez et al 2012, p.28) by providing incentives, with guarantees and privatization policies.

Similarly, the EU Water Initiative (2012) has considerable support for the concepts of “blending” and “leveraging” of private finance. The idea is that bringing in private finance can make state finance go further. There are reportedly various ways to increase the leverage in attracting repayable funding sources. The levers that are used “mostly involve reducing the risks posed by the water sector to potential funders” (EUWI 2011, p. 12) and include guarantees, insurance, co-financing, output-based aid and other devices.

The Water and Sanitation Programme (WSP) also supports leveraging on the grounds that the leverage can help increase the overall domestic potential, reduce risk to commercial lenders and allow for a rational allocation of public funds to pro-poor projects. Leveraging mechanisms include using loan instruments, lending through financial intermediaries, co-investing through private equity funds. There is a huge variety of donor-backed schemes to reduce risk for international investors in developing countries (including WB’s MIGA which has expanded rapidly in recent years). Other methods include hedging products, partial credit guarantees, political risk insurance and risk sharing products (WSP 2012).

Additional arguments in support of leveraging are that if creditworthy utilities use private funds and commercial debt to finance a portion of their investment, this will free up budget allocations for infrastructure investments that are not commercially viable such as water resource development, storage, treatment and expansion into areas where consumers cannot afford a cost recovery tariff. A further supposed advantage is that commercial debt also brings governance benefits in the form of additional oversight from lenders that help utilities improve capital expenditure planning operating efficiency and financial management (WSP 2012).

The OECD also supports leveraging although they point out that this does not actually expand the revenue base as, ultimately, finance has to come from what they term the 3Ts (tariffs, taxes and/or transfers). Only by increasing these can the financing gap be closed. However, repayable private finance can be used to *bridge* the financing gap which will be repaid from future cash flows from the 3Ts (OECD 2010).

In order to make limited funds go further, the OECD suggests that concessionary financing is combined with repayable finance to support a specific project or lending programme. A suggested approach is to use ODA grants to finance interest rate subsidies, seed financing for revolving funds or contributions to the establishment of project preparation facilities (OECD 2010, p.8). A similar approach is to use government or aid funds to support micro-finance institutions to support small-scale service providers. Other blending options include the provision of guarantees, forming grouped financing vehicles (e.g. grouping water companies to carry out a bond issue).

The AfDB suggests building project finance for major infrastructure around loans from IFIs and blending this with other sources such as the EU-Africa Infrastructure Trust Fund while “promoting private management, operation and lease contracts for water supply, sanitation

and waste-water projects, containing performance-related rewards, as an alternative to full private concessions, where the latter are not feasible” (Afdb 2010, p.2).

To facilitate leveraging, the African Water Facility (AWF) was established in 2004 as an initiative of the African Ministers’ Council on Water (AMCOW). In its strategy for 2012-16 it aims to “prioritise its role as a mechanism to leverage investments for water development and management in Africa” (AWF 2012, p.2). The AWF expects to leverage Euro 2.5bn of investments, grants and loans. The priority will be to support the preparation of an increased number of viable and bankable national, regional and trans-boundary water projects that leverage significant investment (AWF 2012, p.7).

Leveraging and blending are gaining in popularity but there are concerns with this approach when applied to raising private sector finance, many of which are set out in Griffiths (2013) and Kwakkenbos (2012). First, private flows are extremely volatile. Second, it is not easy to shape private capital flows by government and/or donor incentives. FDI responds to factors other than donor incentives such as market size, rule of law and infrastructure as well as certain sectors, e.g. over half MIGA’s insurance in 2011 was sold to clients in the infrastructure or extractives sectors (Griffiths 2011).

Third, it is not clear that government and donor funding could not be better spent directly on basic services rather than trying to attract a reluctant private sector to finance basic services. Fourth, accountability and transparency are low when it comes to lending through financial intermediaries and group companies. Fifth, providing guarantees and risk transfers to attract private finance will increase the risk exposure of the government. Private and public finance are not interchangeable as private finance has to be repaid (Bayliss 2009).

Finally, there are inconsistencies in terms of development objectives. Attracting private investment diverts policy towards the needs of businesses which may be odds with social priorities. For example, if leveraging is to be achieved in the water supply, water utilities have to be creditworthy. Relevant factors that affect credit worthiness include: cost recovery tariff policies, annual tariff indexation, low distribution losses and low existing levels of debt, utilities with better ratings had lower non-revenue water and higher metering and operating cost coverage ratios (WSRB/WSP 2011). While these may make for better financial management, they may override concerns regarding equity and social justice. Higher credit ratings will be achieved by providing water to high volume commercial users than to low-income communities.

#### **4 Cost recovery and under-pricing**

To attract private funds, the water sector needs to be financially sustainable. The need for leveraging is interlinked with the need for cost recovery pricing as a stronger financial performance will allow access to revenue sources such as commercial debt finance (WSP 2012, p.1). In addition, cost recovery tariffs are recommended because they will provide market signals so that decisions to consume water (or not) are fully reflective of the associated costs (for example, OECD 2009, p.15).

Higher tariffs are expected to raise additional investment finance, for example: “Underpricing is debilitating the water sector and slowing coverage expansion without contributing much to equity objectives” (Banerjee and Morella 2011, p. 257). For OECD (2009), although it is unusual for tariffs to cover the full costs of providing water and sanitation services, keeping tariffs artificially low for all consumers may result in a vicious circle of underfunded services with insufficient investment and deteriorating infrastructure. They argue that low tariffs prevent extensions of networks to poorer communities and this forces them to pay higher prices from informal providers (OECD 2009). Foster and Briceño-Garmendia (2010) calculate (p. 74) that US\$4.7bn per year could be raised in SSA by increasing user charges for infrastructure to cost recovery levels in the water sector.

Increasing tariffs is justified on equity grounds as a tariff below cost-recovery constitutes a subsidy to those with a water connection which is almost certainly regressive. Increasing and even doubling tariffs is not expected to affect poor households because they are not connected to the piped network (Banerjee and Morella 2011). This stance is replicated in many of the detailed AICD country studies.<sup>7</sup> For example, in Central African Republic, only the richest quintile has access to piped water so any tariff below cost recovery level is considered to be highly regressive (Domínguez-Torres and Foster 2011b).

Proponents of cost recovery tariffs argue that these are affordable because, first, only wealthy households are affected because only these have access. Around 90 percent of the population with piped water access belongs to the richest 60 percent of the population (Van den Berg and Danilenko 2011, p.28). Second, if consumption levels are reduced to subsistence levels, then these tariffs become affordable to a larger proportion of households.

Banerjee and Morella (2011) compare an affordability indicator of 5% of household income spent on water with the cost of a consumption measure of 4m<sup>3</sup> per month (based on an absolute minimum of 25 litres per capita per day<sup>8</sup> for a family of five) and 10m<sup>3</sup> per month (based on a “somewhat more comfortable but still modest” level of 60 litres per capita per day for a family of five). They calculate that the monthly bill ranges from about \$2 to \$8 depending on whether the goal is operating or full cost recovery (FCR).

Pooling data from African households across countries and grouping them into a common set of quintiles, they find that the average household in the first quintile hits the 5% affordability threshold at around \$4 per month which is “more than enough to pay for the subsistence minimum consumption of piped water” (Banerjee and Morella 2011, p.174). Households in the second quintile also can afford to cover operating costs and the other three quintiles do not face any affordability constraints. They conclude, “Very modest consumption baskets priced at levels compatible with operating cost recovery appear to be affordable across the full range of household budgets in Africa” (p.174).

<sup>7</sup> Reference to these studies is made extensively in this paper. Papers are cited in references but often not referred to individually in the text as this would be too cumbersome.

<sup>8</sup> Note that average consumption per person per day in the USA is between 250 and 300 litres.

The detailed AICD country studies take the same approach to show that cost recovery tariffs are affordable. In Kenya, for example, the authors show that if tariffs are increased from the current level of US\$0.58 to the cost recovery level of US\$0.99, the vast majority of Kenyan households could afford the basic subsistence level of consumption of 4 m<sup>3</sup>/month as this would generate a monthly water bill of \$4. Given that 69.4% of households with access to piped water are in the top quintile of the income distribution, a tariff below cost recovery is considered regressive (AICD 2010a). Similarly in Liberia, the assessment of affordability is based on a household of five living on one dollar per capita per day (pcpd). Based on the affordability threshold of 5% of household budget, the authors find that a household “could reasonably devote up to \$7.50 per month” to water and to electricity. Assuming a subsistence consumption of 6m<sup>3</sup> per month (40 litres pcpd), the cost would be \$6 at cost recovery tariffs which would account for 4% of the monthly budget “which may be affordable” (Foster and Pushak 2010b). In Malawi also, a cost recovery tariff of US\$4 a month is considered to be affordable for 70% of Malawi’s population and certainly affordable for the minority with access to piped water (Foster and Shkaratan 2010). In Mali, a tripling of prices is recommended (Briceño-Garmendia et al 2011). The same is said in most of the countries studied including Nigeria, Senegal, Sierra Leone and Zambia. In Niger, a household consumption of 10m<sup>3</sup> a month would not be affordable at cost recovery tariffs but a consumption of 4m<sup>3</sup>, costing \$3.3 is deemed to be affordable for half the population (Domínguez-Torres and Foster 2011d).

## **5 Underpricing in practice**

There are several concerns with the under-pricing arguments. This is not a source of inefficiency in the same vein as leakage rates. The notion that there is some kind of scientifically determined price, at which each household pays their own costs, is flawed. Inevitably some kind of value judgment and some kind of subsidy will apply. For example, there are different perspectives regarding what costs should be covered and by whom. A water supply is usually based on some pre-existing infrastructure so how should this be incorporated into charges to new users? Should the tariff cover leakages? Scale economies have a strong effect on per capita costs in water delivery so how should network extension costs be allocated? It is far from efficient to charge a different tariff to each user but any smoothing of prices will incorporate some kind of cross subsidy.

The cost-recovery agenda outlined above has parallels with other social policies of targeting versus universalism and displays a similar contradiction in that, while ostensibly motivated by greater equity, the removal of subsidies is promoting an individualistic approach which is in line with weaker social solidarity and which ultimately leads to greater inequality. The underlying driving force is not equity but guided by “a philanthropic principle at best and, at worst, a mean-spirited paternalism” (Mkandawire 2005, p.23) as demonstrated by focusing on extracting as much income as possible for a minimal level of consumption to demonstrate affordability. Some of the issues with regard to full cost recovery (FCR) in water are outlined below.

First, if the notion of FCR is taken to its logical conclusion, then those that cost more to serve will pay a higher price and these will be the poorest households, resulting in less equitable outcomes. Poorer households are more costly to serve because they are located furthest from the network and consume smaller volumes. They use standposts which are more expensive due to the need to collect tariffs from numerous individual users. Scale economies mean that large industrial users will be less costly to serve and will therefore pay a lower price. Many African cities are using aging infrastructure which was built in the colonial era to serve a two-tier society and which reaches only a fraction of the current population (as, for example, in Luanda, Pushak and Foster 2010 and Kinshasa, UNEP 2011). Imposing a policy of FCR on such an unequal pre-existing structure will be regressive.

Second, it is not just the wealthy that use utility water as it is often re-sold by private water vendors to low-income households that are unable to afford a connection. Research from Dar es Salaam shows that utility water is delivered in tankers across the city and this water sometimes changes hands several times in the supply chain of private vendors before reaching end users, often some distance from the piped connection. Any cost increases (for example in fuel) are passed on to consumers so increases in the utility tariff will have far-reaching cost implications for poor households (Bayliss and Tukai 2011). Third, there are implicit assumptions regarding the translation of revenue into investment funds. Rather, high prices may reduce consumption, leading to an adverse impact on the overall revenue picture. The revenue impact is uncertain.

Finally, water tariffs in SSA are already high and comparable to those in much wealthier countries in the world. Table 3 shows the average cost of a cubic metre of water in various African countries and in other countries.

**Table 3: Water Tariff in countries of SSA and rest of the world (US\$/m<sup>3</sup>)**

<b>Sub-Saharan Africa</b>		<b>Rest of the world</b>	
Cape Verde	4.43	Denmark	4.32
Angola	2.30	Australia	3.14
Burkina Faso	1.23	Germany	3.33
Senegal	1.14	France	3.24
Cote d'Ivoire	0.89	UK	2.07
South Sudan	0.85	Czech Republic	1.86
Uganda	0.76	Canada	1.95
Benin	0.72	Poland	1.44
Cameroon	0.70	USA	1.29



Country	Country tariff US\$/m <sup>3</sup>		Actual as % of FCR tariff	USA Equivalent \$/m <sup>3</sup>	
	Actual Tariff	Cost Recovery Tariff		Actual Tariff	Cost Recovery Tariff
Angola	2.30	2.70	85.19	29.67	34.83
Benin	0.72	1.10	65.45	42.61	65.10
Botswana	0.61	0.91	67.03	4.15	6.19
Burkina Faso	1.23	1.15	106.96	127.09	118.83
Cameroon	0.70	0.97	72.16	27.41	37.98
Cape Verde	4.43	0.76	582.89	61.64	10.57
Central African Republic	0.57	1.10	51.82	56.27	108.59
Congo, Dem. Rep.	0.65	1.00	65.00	168.75	259.61
Congo, Rep.	0.49	0.80	61.25	9.12	14.89
Cote d'Ivoire	0.89	1.17	76.07	33.75	44.36
Ethiopia	0.32	0.67	47.76	45.96	96.23
Kenya	0.58	0.99	58.59	34.23	58.43
Liberia	0.45	1.00	45.00	90.49	201.09
Malawi	0.37	0.55	67.27	56.66	84.22
Mali	0.34	1.07	31.78	26.31	82.80
Mozambique	0.64	1.13	56.64	68.51	120.97
Niger	0.55	0.82	67.07	71.00	105.86
Nigeria	0.38	0.61	62.30	15.78	25.32
Senegal	1.14	1.25	91.20	46.94	51.47
Sierra Leone	0.22	0.65	33.85	22.73	67.16
South Sudan	0.85	1.13	75.22	23.37	31.07



Sudan	0.60	0.69	86.96	21.67	24.92
Tanzania	0.50	0.68	73.53	46.31	62.98
Uganda	0.76	1.2	63.33	70.52	111.35
Zimbabwe	0.30	0.74	40.54	27.64	68.19
AVERAGE	0.82	0.99	85.39	49.14	75.72

Source: Adapted from AICD Reports and World Development Indicators

Only in Cape Verde and Burkina Faso does the current tariff recover costs. Elsewhere the existing tariff only covers a proportion of costs (Column 4) and in some cases, such as Mali and Sierra Leone, tariffs only cover about a third of costs. On average cost recovery seems to be about 85% but when Cape Verde is taken out, actual tariffs are around 65% of the cost recovery level. In most countries, the findings from the AICD studies indicate that prices need to increase substantially, and in several countries they need more than to double if they are to cover costs.

Much of the analysis presented in the AICD studies (discussed above) suggests that these prices are affordable but affordability is difficult to measure. Poor households pay a high price for water from private vendors but that does not necessarily mean that they can afford the tariff. Rather, water is one of the few essential items that have to be paid for possibly at the expense of other important expenditures. The AICD reports measure affordability as 5% of income but this is not necessarily equitable across income levels. For a wealthy household, 5% is arguably more affordable than for poor households. In addition, there is also no distinction regarding the amount of water consumed as is evident in the studies for the AICD when affordability appears to increase if a lower volume of consumption is assumed.

An alternative indicator of relative affordability is based on international comparisons of the cost of a unit of water relative to income. The following ratio was created for the African countries for which data were available from AICD reports:

$$\text{Cost of a cubic meter of water: GDP per capita}^9$$

This provides a measure of the proportion of average income needed to purchase a cubic meter of water in each country. This was then applied to the GDP per capita of the USA to determine the relative cost for each country if the same proportion of income was required to purchase a meter of water in the USA. This has been termed the “USA equivalent” tariff. Columns 5 and 6 of Table 4 show the USA equivalents for actual and cost recovery tariff for the countries for which there is price data, and this ranges from US\$4 in Botswana (a figure shaped by the country’s high GDP per capita, in part due to mineral wealth) to over US\$200

<sup>9</sup> Source: <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

per cubic metre in other countries (Democratic Republic of Congo and Liberia). Bearing in mind that the actual tariff in the US (Table 3) is US\$1.29 per m<sup>3</sup>, the AICD reports are recommending that, relative to incomes, prices in SSA be increased to levels that are far higher level than those in other regions.

It is, however, noted that it is only the wealthiest that have access to water in most African countries. For this reason a further estimate of the USA equivalent tariff was calculated using just the GDP per capita of the wealthiest quintile and the results are shown in Table 5.

**Table 5: USA equivalent for top quintile**

	1	2	3	4	5	6	7
				Country tariff US\$/m3		USA Equivalent \$/m3	
Country Name	Income share top quintile%*	GDP/capita top quintile	Actual Tariff	Cost Recovery Tariff	Actual Tariff	Cost Recovery tariff	
Angola	49	8,534	0.61	0.91	3.34	4.99	
Botswana	65	22,350	0.61	0.91	1.28	1.90	
Burkina Faso	47	1,054	1.23	1.15	54.08	50.57	
Cameroon	51	2,945	0.7	0.97	10.77	14.92	
Cape Verde	56	9,134	4.43	0.76	21.97	3.77	
Central African Republic	49	1,134	0.57	1.10	22.78	43.96	
Congo, Dem. Rep.	51	442	0.65	1.00	66.70	102.61	
Congo, Rep.	53	6,462	0.49	0.80	3.44	5.61	
Cote d'Ivoire	52	3,212	0.89	1.17	12.95	17.03	
Ethiopia	39	641	0.32	0.67	23.33	48.85	
Kenya	53	2,099	0.58	0.99	12.92	22.05	
Liberia	45	523	0.45	1.00	40.22	89.37	
Malawi	46	708	0.37	0.55	24.42	36.30	
Mali	46	1,390	0.34	1.07	11.44	36.00	
Mozambique	53	1,128	0.64	1.13	25.71	45.39	
Niger	50	883	0.55	0.82	28.23	42.09	
Nigeria	49	2,652	0.38	0.61	6.49	10.42	

Senegal	46	2,606	1.14	1.25	20.45	22.43
Sierra Leone	49	957	0.22	0.65	10.65	31.48
Tanzania	42	1,068	0.5	0.68	21.90	29.78
Uganda	49	1,204	0.76	1.2	28.61	45.17
Zambia	55	3,264	0.48	N/A	6.88	-
Zimbabwe	77	1,886	0.3	0.74	7.21	17.78

Sources: Ortiz and Cummins (2011), World Development Indicators, AICD Reports

Clearly the USA equivalent price (i.e. the equivalent proportion of income that would be needed to purchase a unit of water with USA per capita income) is lower when the comparison is based on the top quintile income level rather than national GDP per capita figures. However, in most cases, prices are still very high relative to incomes. In some countries with considerable mineral wealth and highly skewed income distributions, the relative USA equivalent tariff is below \$10 per m<sup>3</sup> (Botswana, Republic of Congo) but elsewhere, even the top quintile has a low per capita income so that the equivalent tariff, relative to income, is substantially higher than tariffs in developed countries (Democratic Republic of Congo, Liberia – compare with Table 3).

The USA equivalent tariff does not provide an absolute measure of water affordability but indicates that, as a general trend, water tariffs in SSA are high relative to income levels. A policy of raising investment finance by increasing prices further is likely to create challenges in terms of affordability and may have the perverse effect of reducing the overall revenue as consumption may fall. In addition, patterns of global inequality will be exacerbated.

## 6 The public investment alternative

While the AICD has provided extensive insight into the state of African infrastructure, the policies proposed by governments and donors are little different from those of the past two decades with an emphasis on the private sector and squeezing more from the not very wealthy. The need for more efficient institutions has long been recognized but increasing prices is a different kind of measure from reducing leakages and improving bill collection, and one which may have perverse and inequitable outcomes. While there is considerably greater understanding of the nature and scale of the infrastructure deficit, the policy response shows little progress.

Strengthening the public sector and revenue mobilization scarcely features in responses to the need for infrastructure finance. For donors, most notably the World Bank, there is hesitation when it comes to promoting domestic revenue mobilization for public investment in infrastructure. Instead, low tax rates are encouraged (for example World Development Report 2006). Taxation is a factor in the rankings of the World Bank's "Doing Business" Reports where countries are ranked according to ten areas of regulation related to the business environment. One of the indicators is paying taxes which aims to capture the

administrative and financial burden of a tax regime. Countries with lower tax rates score more highly.<sup>10</sup>

Raising investment to levels required to plug the “financing gap” requires greater public revenue. This has been the mainstay of infrastructure development across the world. Throughout history, improvements in water and sanitation services have been the result of public spending. In industrialized countries, the initial construction of water supplies was often by private sector agents but these were often unwilling to extend coverage to poor neighbourhoods, improve quality or reduce excessive charges. Public authorities intervened to make access universal, reduce the incidence of water-borne disease and provide water for fire fighting. Public investment increased as governments recognized that the provision of clean, safe and reliable water generated economic, political and social benefits (Prasad 2007, p.13).

Hall and Lobina (2006) show how European and US water and sewerage networks were developed using public funding mechanisms even in the UK and France - countries which have since become pioneers of privatization. In the UK, access to a piped water connection increased from less than 10% of British households in the mid-nineteenth century to over 90% by the mid-twentieth century. The state bore most of the cost of drinking water supply and resource development as the water supply was considered to be a welfare service with significant impact on public health and environmental quality (Bakker 2007). In France a special fund was created to increase water access in rural areas (Prasad 2007). A World Bank study of public finance for WSS in Africa also finds that increasing access is associated with a substantial increase in public expenditure (Senegal, Burkina Faso, Niger, Benin, Mali), although the link is not clear-cut (van Ginneken et al 2012).

Even where funds are raised from the private sector, the state has a significant role in raising development finance. Municipalities developed financial mechanisms to borrow long-term money from local savers at low rates of interest. In New York investment and expansion was financed by the issuance of municipal bonds. Investment is supported by state lending institutions such as development banks and pooled financing mechanisms such as Clean Water State Revolving Fund in the USA which is sustained by borrowing from the federal government at low interest rates (Hall and Lobina 2006). Government bond issues for infrastructure are common in the UK, USA and France but less so in developing countries. The state is vital to the use of local capital markets for infrastructure finance (Mbeng Mezui and Hundal 2013).

Public investment offers advantages over other revenue sources as it is cheaper than private finance, more predictable than aid and private finance, and more easily targeted at poor households than private finance (Griffiths 2013). In addition, it is beneficial for private investment: “No country has sustained rapid growth without also keeping up impressive rates of public investment – in infrastructure, education and health. Far from crowding out private investment, this spending crowds it *in*” (Spence 2008 p.5). Public capital stock per

<sup>10</sup> The paying taxes indicator has raised concerns – see report from the Independent *Doing Business* Report Review Panel, June 2013, <http://www.dbrpanel.org/sites/dbrpanel/files/doing-business-review-panel-report.pdf>

capita is a positive and significant determinant of private capital accumulation suggesting that public and private investments are complementary (Bayraktar and Fofack 2011).

Mobilizing tax revenue is more challenging in low-income countries where tax revenue tends to be lower in relation to GDP (Banerjee and Morella 2011, p.233) although revenues have begun to rise over the past decade (Griffiths 2013). Auriol and Warlters (2010) find that tax revenue as a proportion of GDP is typically about 20 percentage points lower in African countries than in rich OECD countries. In SSA, there is also a high level of instability in tax revenues which leads to public investment and government consumption instability (Ebeke and Ehrhart 2011). However, there is considerable scope for improvement. The tax revenue base has suffered from a marked increase in the extent of tax incentives offered to investors in the region as countries have competed to attract investment, with questionable benefits. Over the past ten to twenty years, African countries have lowered trade taxes to improve competitiveness and introduced VAT in part to compensate for lost trade tax revenues. The effectiveness of these incentives is described as “unclear, at best” (Keen and Mansour 2009).

Based on analysis of data from 38 countries, Auriol and Warlters (2010) find considerable scope for increasing total tax revenue in most African countries. In their findings they say the removal of exemptions from goods taxation (offered to some large companies with the aim of encouraging investment) “should be the first priority when consideration turns to increasing revenue” (Auriol and Warlters 2010 p.26). Evidence from Kenya shows that the disadvantages of tax incentives vastly outweigh the advantages and that incentives are not needed to attract foreign investment (TJN-A and AAI 2012).

In addition, capital flight has resulted in trillions of untaxed financial assets. Research cited by Griffiths (2010, p. lxxv) finds that the proceeds of commercial tax evasion, mainly through trade mispricing, are by far the largest component of cross-border illicit financial flows, constituting around 60 to 65 percent of the global total. This greatly exceeds proceeds from bribery or criminal activities such as drug trafficking. Illicit capital flight is likely to be deeply regressive as it leads to a loss of tax revenue that could have been spent on public services and is used by the wealthiest sections of society to avoid taxation.

The revenue base for African states could be increased substantially by removing tax incentives and stemming capital flight. In addition, governments have been trying to harness more money from resource extraction for development purposes. The African Mining Vision was adopted by Heads of State at the February 2009 African Union Summit with a view to improving the development outcomes from mineral extraction. It is described as “Africa’s own response to tackling the paradox of great mineral wealth existing side by side with pervasive poverty”.<sup>11</sup>

In the past, policy with regard to mineral extraction was dominated by a focus on meeting the needs of FDI but the recent commodity boom has increased awareness of the vast revenues to be earned from resource extraction which has minimal benefit (or which even makes things worse) for local communities. Many companies are now obliged to compensate for environmental damage. A study by UNECA (2011) for the Africa Mining

<sup>11</sup> [www.africaminingvision.org](http://www.africaminingvision.org)

Vision suggests the establishment of regional development funds could avoid possible pitfalls of large revenue from extractive sectors.

Several countries in Latin America have revenue-sharing arrangements where, for example, a component of government revenue from an extractive resource is distributed to the affected community but such arrangements are much less common in Africa. A similar approach is to attach demands to mineral and forestry concessions. In Liberia, a significant component of infrastructure is built and operated by multinational companies that have taken on concessions in mining, forestry and agriculture (including rubber and palm oil). New rounds of concessions are each expected to have major infrastructure requirements attached (Foster and Pushak 2010b). This is applied mainly to roads in rural areas but could be applied to other forms of infrastructure.

Rather than trying to extract more revenue from households with little money, a greater redistributive and equitable impact can be achieved by targeting global companies with high levels of wealth. While there are challenges with state capacity and absorption, an innovative financing mechanism could link infrastructure investment directly to payments of special levies by international extraction firms. This would greatly enhance the local and national impact of such investments which often have an adverse impact on local communities.

## **7 Conclusion**

The recent debates about how best to fill the “financing gap” that have emerged in relation to infrastructure in SSA are noteworthy for the omission of the public sector as a potential source of increased revenue. The state has been a key player in infrastructure development around the world. Developed countries achieved universal coverage of basic services with government spending, raised by taxation and government loans. Reducing tax incentives, curbing capital flight and attaching greater demands to resource extraction licences offer considerable scope for revenue generation that could be directed towards infrastructure development.

The ICA, the AICD, the AfDB, the World Bank and other donors are clearly attached to a neoliberal ethos despite nearly three decades devoted to commercialization and privatization with negligible positive impact. The drive to increase tariffs and encourage private sector involvement is based on a perception that market signals will lead to efficiency but there is no “market” for water. Rather, there are costs associated with a system of provision, and the way in which these are allocated across members of society is a political process

Public investment is not a golden ticket. Still other issues need to be addressed such as weak capacity and high arrears from public institutions. However, based on historical global experience, this offers the most promise for improving services. It is well known that there are huge social benefits from the provision of water and sanitation that greatly exceed the cost, but these investments do not generate commercial returns. A major shift in policy approach is required. Future development of WSS services requires reorientation away from the current emphasis on the private sector to stronger support for the state.



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