

Private Sector Participation in Infrastructure in Africa

Afeikhena Jerome
African Peer Review Mechanism Secretariat (APRM)
Unit A 101, Gateway Park
Cnr Challenger & Columbia Ave
Midridge Park
Midrand 1685
South Africa
email: afeikhenaj@nepad.org

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Abstract:

In recent years, there has been a profound reassessment of public policy towards the infrastructure sectors globally with a palpable shift in orientation towards private management and ownership. This study appraises the record of private sector participation in infrastructure (PPI) in Africa. The results of almost two decades of regulatory reforms, implementation of the privatization and liberalization agenda, combined with the influx of private investment in infrastructure have decidedly been mixed. There has been a “policy mistake” founded on the dogma that infrastructure would be financed by the private sector. For various reasons, mainly involving investment climates and rates of return, private investment has been limited in terms of volume, sectors and countries.

The experience of the last 15 years, however, shows that most countries will be better off working out a partnership with the private sector to achieve sustained efficiency gains and minimize fiscal financing requirements. To begin to solve Africa’s infrastructure investment problems, broad institutional reform along with greater financial commitments by governments and the private sector will be required. Private participation in infrastructure requires fiscal reform and improvements in public sector management. It also requires careful attention to the basics of project design, including identifying and allocating risk and ensuring sound procurement practices.

Key words: Infrastructure, reform, privatization and Africa

JEL Classifications: F3, L3, L9, N17, O55

1. Introduction

Traditionally, infrastructure industries are monopolies, owned and operated by the public sector. For much of the 20th century, infrastructure services in most countries were provided by state-owned utilities that were vertically integrated. Although this model initially produced some desirable results, it ultimately led to serious problems, especially in developing countries. These problems included under-investment caused, to a large extent, by under-pricing, low productivity, poor service delivery, long queues, lack of access to basic services; lack of transparency, and damaging political interference in the operations of these infrastructure entities (World Bank, 2004).

Since the late 1980s, there has been a profound reassessment of public policy towards the infrastructure sectors. There has been a shift towards private management (private sector participation) and private ownership (privatization) of these industries, as well as the competitive provision of services within parts or all of these sectors (liberalization), first, because of the generally poor performance of state-owned monopolies, and second, because of the rapid globalization of world economies, which has brought into sharp focus the economic costs of inadequate infrastructure, and has prompted several developing countries to seek new initiatives in promoting competition, involving private and foreign interests in the provision of infrastructure.

In the face of extraordinarily weak performance in the provision of infrastructure, the debt and fiscal crises that emerged in the early 1980s in many developing and transition economies, and the recognition that infrastructure is a critical tool in sustainable economic growth and international competitiveness, many African countries began to consider alternative means of infrastructure development. Subsequent to the endorsement and promotion of infrastructure privatization by international development agencies, many countries in Africa have been implementing far-reaching infrastructure reforms including restructuring, privatization, and establishing new approaches to regulation over the past decade. These reforms are being implemented to promote private investment, provide strong incentives for operating efficiency, restore the financial viability of virtually bankrupt state-owned network utilities, especially through the promotion of more rational pricing policies that would improve service quality and eliminate service backlogs, introduce greater transparency in the operations of these industries, and also insulate the operating infrastructure entities from damaging political interference.

This study appraises the record of, and modalities for enhancing private sector participation in infrastructure in Sub-Saharan Africa. It is of the view that the PPI approach in Africa has not, at least not yet, produced the massive investments and dramatically improved technical performance hoped for. Notwithstanding some notable successes, overall outcomes have fallen short of expectations. Limited private financing has been mobilized; a number of concessions have run into problems; in many countries, the cost of infrastructure services has not diminished, and increases in quality and access rates have not materialised as anticipated.

The infrastructure backlog is huge. By most measures, Sub-Saharan Africa has lower access to infrastructure than any other region of the world. So far, the region's track record of investment suggests that the private sector by itself is unlikely to provide the kind of near-term funding needed to address these shortcomings. With Africa's low levels of infrastructure investment in the face of rapidly growing needs, the private sector appears capable of supplying only a fraction of the estimated US\$5-12 billion a year in additional infrastructure finance that Africa needs to meet its Millennium Development Goals for infrastructure.

The solution is not, however, to return to a strategy of improving state firms under public management. Any effort to reapply that strategy would have to overcome the many serious problems encountered the first time around.

The experience of the last 15 years shows that most countries will be better off working out a partnership with the private sector to achieve sustained efficiency gains and minimize fiscal financing requirements. However, not every sector of every country has been or will be able to achieve this. Moreover, even when these partnerships will be possible, the main responsibility for financing many of the investment needs will fall onto the taxpayers rather than the residential users, at least in capital intensive transport and water and sanitation.

The paper is structured in five sections. Section 2 appraises the relationship between infrastructure and development; section 3 present trends in private sector in infrastructure, section 4 is a sectoral evaluation and Section 5 concludes.

2. Infrastructure and Development

Until recently, infrastructure as a concept has largely been absent from the sphere of economic thought. Curiously, for two centuries, infrastructure as an analytic concept has been practically absent from economic discourses (Prud'homme, 2004). However, by the 1990s, it dominated the scene, with a vast body of literature on its contribution to economic growth. After many years of neglect, Infrastructure is, again back on the development agenda, with renewed emphasis on the role of infrastructure in growth and poverty reduction (Estache, 2006).

There is no ironclad definition of infrastructure. It is most commonly discussed in terms of its characteristics - longevity, scale, inflexibility, and higher investment costs - but that is seldom seen as satisfactory. Increasingly, its meaning has been shifting from one focusing on physical fixed assets such as roads, airports, sea ports, telecommunications systems, water distribution systems and sanitation (what might be called 'public utilities'). It now often embodies notions of softer types of infrastructure such as information systems and knowledge bases (Button, 2002).

Recent research confirms the importance of infrastructure in the promotion of sustainable development. The World Bank landmark study on infrastructure (World Bank, 1994) highlighted the critical role of infrastructure in the development process and laid out an

agenda for public-private partnerships in the provision of utility. The evidence in the World Bank Report on the vital role of infrastructure in growth has been reinforced by subsequent research, for example, on Africa's economic performance. The development of infrastructure services contributes to growth, while growth also contributes to infrastructure development; it has been characterized as, 'a virtuous cycle'. Moreover, investments in human capital and in infrastructure interact, each increasing the returns on the other.

In view of the size of their operations and the importance of the services they provide for other sectors, infrastructure should be the leading agent in the efforts of developing countries to increase productivity. Infrastructure has a substantial role to play in enhancing private sector development and raising the productivity of the poor by improving their access to markets, local and foreign, reducing the risks of private investments which will provide them employment, and providing them with better information about market opportunities and ways to improve livelihoods.

Infrastructure can also contribute to poverty reduction through the opportunities they create for increasing the employment intensity of economic growth. The importance of employment-generating activities, especially for women, has been noted in a number of poverty reduction strategy papers (PRSP). Many participatory poverty assessments reveal how much the poor value infrastructure services. This is so because they directly benefit from these services.

While economic infrastructure - essentially, transport, energy, ICT, water, sanitation and irrigation - is specifically identified in the MDGs only in respect of water and sanitation, telephones, personal computers and internet users, in many ways, infrastructure investments underpin virtually all the MDGs including halving poverty in the world by 2015. It is widely acknowledged that the contribution of infrastructure to halving income poverty or MDG 1 is more significant than the other goals (Willoughby, 2004). Infrastructure also affects non-income aspects of poverty, contributing to improvements in health, nutrition, education and social cohesion. Indeed, infrastructure makes valuable contributions to all the MDGs (Willoughby, 2004). The many benefits of infrastructure have also been confirmed by the UN Millennium Project (2005), which advocates a major increase in basic infrastructure investments to assist countries (especially in Africa) escape the poverty trap, and by the Commission for Africa (2005).

3. Trends in Private Participation in Infrastructure in Africa

Governments around the world have adopted a wide variety of approaches in engaging the private sector in the delivery of infrastructure services. Options range from service contracts, in which relatively few responsibilities and risks are passed to the private sector, to concession contracts and divestitures, in which the private sector takes full responsibility for operating and investing in infrastructure services and therefore takes on significant commercial risks. The main distinction among the key PPI approaches is how responsibility is allocated for asset ownership, operations and maintenance, capital investments, and commercial risk, as shown in Table 1.

Table 1
Options for Private Sector Participation in Infrastructure

Approach	Asset Ownership	Operation & Maintenance	Capital Investment	Commercial Risk	Contract Duration
Service Contract	Public	Public/private	Public	Public	1-2 years
Management Contract	Public	Private	Public	Public	3-5 years
Lease	Public	Private	Public	Shared	8-15 years
Concession	Public	Private	Private	Private	25-30 years
Build-Operate-Transfer (BOT)	Public and Private	Private	Private	Private	2-30 years
Divestiture	Private or public and private	Private	Private	Private	Indefinite or limited by license

Source: Adapted from World Bank’s Private Participation in Infrastructure (PPI) database.

Drawing from the World Bank’s Private Participation in Infrastructure (PPI) database, we evaluate the extent of private sector participation in infrastructure in Africa¹.

According to this database, 150 low- and middle-income countries transferred to the private sector the operating risk for 3,268 infrastructure projects between 1984 and 2005, attracting investment commitments of \$962 billion as indicated in Table 2; though, actual investment may have been somewhat lower due to some cancelled projects.

Table 2
Private Sector in Infrastructure Projects by Region (1990-2005)

Region	Total Number of projects	Percentage of Total	Total Investment Commitments US \$ million	Percentage of Total
East Asia and Pacific	857	27.1	224,194	23.3
Europe and Central Asia	683	19.5	182,449	19.0
Latin America and the Caribbean	1,102	33.7	407,202	42.3
Middle East and North Africa	95	2.9	41,167	4.3
South Asia	255	7.8	70,435	7.3
Sub Saharan Africa	276	8.4	36,510	3.8
Total	3,268	100	961,954	1000

Source: Adapted from World Bank’s Private Participation in Infrastructure (PPI) database

¹ Due to the way data from the PPIAF data is structured, much of the discussion in this section is limited to Sub-Saharan Africa

Sub-Saharan Africa attracted \$36.510 billion in investment commitments between 1990 and 2005, as indicated in Table 2². This represents about 3.8 per cent of the cumulative investment in developing countries. In spite of this dismal performance, South Africa accounted for about half of these flows (about US\$19 billion from 1990-2004). And Nigeria has claimed a rapidly growing share, about 14 percent over the 15-year period, with much of that investment coming since 2001. Excluding South Africa, the region's share of the total for low- and middle-income countries is less than 2 percent.

Table 3: Number of Private Sector in Infrastructure Projects by Primary Sector in Sub-Saharan Africa (1990-2005)

Financial Closure Year	Energy	Telecom	Transport	Water and Sewerage	Total
1990	1	0	1	0	2
1991	1	0	1	1	3
1992	0	3	0	1	4
1993	3	3	3	1	10
1994	4	3	1	0	8
1995	3	10	2	1	16
1996	5	9	4	1	19
1997	6	15	5	0	26
1998	5	15	7	1	28
1999	7	13	6	4	30
2000	5	18	6	1	30
2001	6	16	2	3	27
2002	3	3	2	1	9
2003	8	9	10	1	28
2004	3	10	4	0	17
2005	9	5	4	1	19
Grand Total	69	132	58	17	276

Source: World Bank's Private Participation in Infrastructure (PPI) database

By 2005, 47 of 48 Sub-Saharan countries had awarded 276 infrastructure projects with private participation over the 15-year period though this is likely to have been

² This may have been underestimated since the data on private activity exclude small-scale private service providers, which play an important role in Africa.

underestimated, but only 4 countries had projects in all 4 infrastructure sectors. The projects’ average size was only about a quarter of what obtains in the rest of the developing world. Indeed, Africa has had relatively widespread private activity, but fewer and smaller projects per country than in more affluent regions.

After a slow start in the 1980s, private activity in infrastructure in sub-Saharan Africa grew significantly in the 1990s. Annual investment in infrastructure projects reached a peak of \$5.9 billion in 2003, then declined to \$3.99 billion in 2004 and increased to \$5.859 billion in 2005 (Table 4). The peak investment levels were driven by the privatization of South Africa’s Telkom and the award of mobile phone licenses, particularly those for Vodacom and MTN in South Africa.

Table 4: Private Sector Investment in Infrastructure Projects by Primary Sector in Sub-Saharan Africa (US\$ million)

Investment Year	Energy	Telecom	Transport	Water and Sewerage	Total Investment
1990	40	0	0	0	40
1991	0	0	0	0	0
1992	0	20	0	0	20
1993	0	1	31	0	31
1994	76	553	18	0	647
1995	77	677	63	0	817
1996	744	961	28	20	1,753
1997	754	1,713	469	0	2,936
1998	716	1,150	336	0	2,201
1999	537	1,160	1,087	82	2,867
2000	463	1,460	183	31	2,137
2001	655	2,812	484	3	3,955
2002	484	2,751	101	0	3,335
2003	1,597	3,982	335	9	5,923
2004	240	3,563	187	0	3,990
2005	789	4,565	504	0	5,859
Grand Total	7,171	25,369	3,826	146	36,510

Source: World Bank’s Private Participation in Infrastructure (PPI) database

An emerging trend is the increasing importance of China, India, and a few Middle Eastern Gulf nations in African Infrastructure. A recent study indicates that investment commitments in Africa by these emerging financiers jumped from less than \$1 billion per year before 2004 to \$8 billion in 2006 and \$5 billion in 2007. By far, the largest contributor was China

whose contribution started from a low base (less than \$1 billion per year before 2004) but rose to over \$7 billion in 2006, and dipped to \$4.5 billion in 2007 (Foster, et. al 2008). Noteworthy, however, is that nearly 70 percent of Chinese investments are concentrated in resource rich Angola, Nigeria, Ethiopia, and Sudan, a reciprocity demonstrating the huge appetite of China for Africa's oil.

Sub-Saharan Africa's share of private sector investment in infrastructure has been heavily tilted toward telecommunications. As indicated in both Tables 2 and 3, Telecommunications is the leading sector with private sector participation in sub-Saharan Africa, both in terms of capital invested (\$25.369 billion or 70.3 percent) and the number of projects (132 or 58.2 percent), a far larger share than the 47 percent in the rest of the developing world. Energy ranked a distant second both in investment (\$7.171 billion or 19.8 percent) and in the number of projects (69 or 16.5 percent). Among recent energy projects, the largest is the 865-kilometer pipeline to transport natural gas from fields in Mozambique to South Africa, a US\$1.2 billion project.

Transport had the next largest share of activity, with US\$3.826 billion. Nearly 60 percent of this went to toll roads, mostly for long-term concessions. 56 transport projects reached financial closure in the period 1990-2005. The largest recent project is the US\$450 million Bakwena Platinum Toll Highway, linking Pretoria to South Africa's border with Botswana. Investment in water and sewerage projects lagged far behind other sectors, at US\$1.46 billion (less than 1 percent of the total) for 17 projects between 1990 and 2005. However, many African governments bundle energy and water into one large utility that they then turn over to private operators. Africa had 12 such projects between 1990 and 2005, more than any other developing region. These projects accounted for about 5 percent of total investment, though anecdotal evidence suggests that most investment went into electricity rather than water. Regional investors, mainly from South Africa, have played a key role in all infrastructure sectors, accounting for more investment (about 38 percent) in Africa than any other category of investor in period between 1998 and 2005 (Schur, von Klauudy, and Dellacha 2006).

About 27 projects or 10 percent of the total infrastructure projects with private participation implemented in Sub-Saharan Africa between 1990 and 2005 period have been cancelled³ or classified as "distressed", representing US \$ 1,982 million or about 5.4 percent of investment commitments in the period. Other developing regions had similar slightly higher project failure rates (5.5 percent) but lost a much larger share of

³ Canceled projects are those in which private sponsors sell or transfer their economic interest back to the government; remove all management and personnel; or cease operation, service provision, or construction. Distressed projects are those under international arbitration or for which cancellation has been formally requested.

investment commitments (9.5 percent). 10 of the cancelled or distressed projects in Africa were small Greenfield mobile operations that failed to build a sizable customer base. Management and lease contracts are lower risk, and are popular in the region, but these characteristics do not guarantee their sustainability.

Sub-Saharan African countries have tended to rely mainly on Greenfield projects to increase capacity. This type of project, used mainly for mobile telecommunications, led in private activity in investment and number of projects (159 projects or 75 percent). Concessions followed, accounting for 47 projects of total investment and this is closely followed by management and lease contracts with 44 projects. Divestiture accounted for only 26 projects. These transactions usually involved the sale of controlling stakes, through international tenders, to strategic investors committed to managing the companies and complying with a predefined investment programme. Most divestitures took place in telecommunications and involved incumbent national operators.

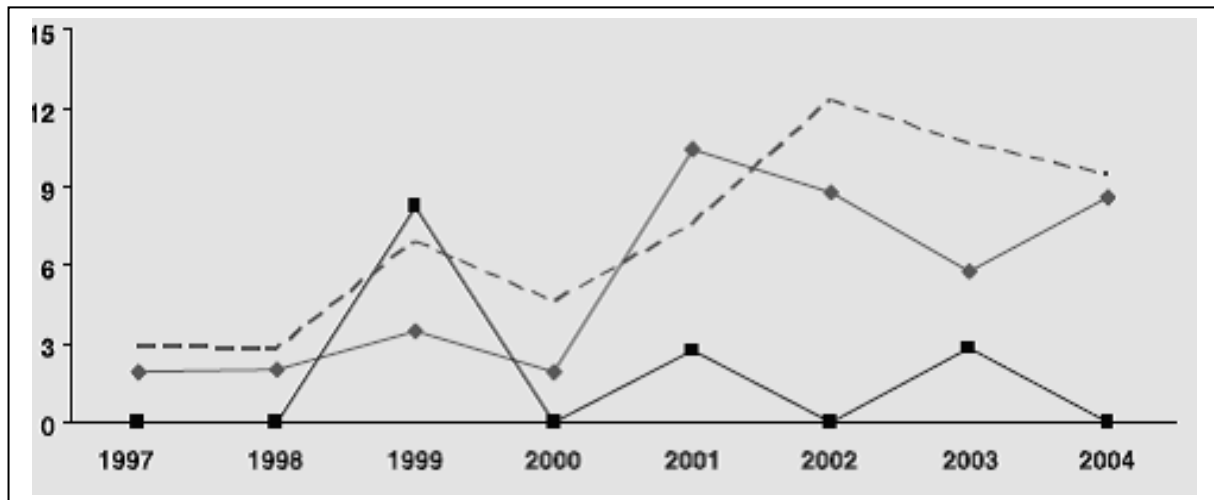
The top five countries, which attracted the most investment during the period, were South Africa, Côte d'Ivoire, Nigeria, Tanzania, and Zimbabwe. They collectively accounted for 73 per cent of sub-Saharan Africa's total investment. South Africa led in private activity in the region, capturing 33.6 per cent of the investment. However, its share of the private infrastructure projects in the region was much smaller—only 10.5 per cent. Nigeria was next with 21 projects representing 23.88 percent of total investment flows. In per capita terms, Gabon led the pace, closely followed by Cape Verde, Mauritius, and Seychelles.

Infrastructure projects with private participation are often financed with a mix of equity and non-recourse debt (debt contracted by the project company without recourse to the sponsors, also called project finance). Limited access to such debt can severely damage an economy's ability to attract private investment in infrastructure. Project sponsors will rarely finance infrastructure projects with equity only, or take the project debt fully on their balance sheets.

Africa has attracted less non-recourse bank debt relative to private investment in infrastructure than other developing regions as shown in Figure 1. It has been even less successful in raising project finance in capital markets through project bonds. And most of this bond financing was raised for South African projects through local currency issues in that country's capital markets.

Sheppard, von Klaudy, and Kumar (2006) identify three related sets of factors that limit Africa's ability to tap both foreign and local currency markets to raise private finance for infrastructure, especially long-term debt finance. First, most African countries have low or nonexistent sovereign credit ratings. Only 16 of 48 countries have foreign currency debt ratings, and only 4 of these have ratings of BB- or higher, which provide relatively broad access to financial markets. The countries that have obtained (or have an estimated) foreign currency debt rating of at least BB- represent only 43 percent of regional gross national income (GNI)—and this share is dominated by South Africa. In all other developing regions the share is more than two-thirds of regional GNI, and in East Asia and Pacific, close to 100 percent.

Figure 1: Sub-Saharan Africa's Share of Project Finance and Private Infrastructure Investment Flows to Developing Countries, 1997-2004 (Percent)



Source: Sheppard, von Klaudy, and Kumar (2006)

For most African countries, foreign commercial lending is therefore difficult to access and typically limited to short-term transactions. The ability of infrastructure projects to tap long-term foreign currency lending has depended on a mix of factors that mitigate risk. These include the ability to generate foreign currency revenues and strong support by official (bilateral or multilateral) agencies.

Second, most local financial markets have limited capacity to finance infrastructure projects. Only South Africa has domestic banks and a local capital market capable of consistently providing local currency financing for infrastructure projects on suitable terms and in significant amounts.

In virtually all other African countries local long-term financing has been limited, and infrastructure projects have needed substantial credit enhancement (for example, through guarantees), provided mostly by official agencies, to attract local currency debt.

Third, features typical of infrastructure projects raise the risk of investments. Compared with projects in many other sectors, those in infrastructure tend to have longer payback and build-out periods and to be more susceptible to political and regulatory interference, which increases the regulatory risk such investments may face.

Together, these factors have helped shape the characteristics of infrastructure projects with private participation in Africa: the projects have typically been small relative to those in other regions, and many have been financed entirely with equity. Projects with economics permitting faster payback and shorter-term debt (such as telecommunications) have tended to be favoured over those with long payback periods and requiring long-term financing to offer services at an affordable price (such as toll roads). And projects have often depended crucially on support by official agencies.

4. Sectoral Evaluation of Infrastructure reform efforts

Until recently, there have been fewer assessments of PPI in SSA, and the few evaluation studies have used less sophisticated methodologies relative to those applied in other regions. The number of rigorous studies remains low and the empirical evidence is insufficient to reach a definitive conclusion regarding PPI's effects.

In what follows, we appraise the main developments in each sector.

4.1 Water and Sanitation

About 1.1 billion people in the developing world currently lack access to clean water; and nearly 2.6 billion, lack adequate sanitation. An estimated 12.2 million people die every year from diseases directly related to drinking contaminated water (United Nations, 2006).

In water and sanitation, as in other areas of human development, Sub-Saharan Africa is falling further behind. Africa has the lowest water supply and sanitation coverage, compared to other regions of the world. In 2004, the ratio of the population with access to improved water source and sanitation were 56 per cent and 37 per cent respectively.

By 2015 Sub-Saharan Africa will account for more than half of the global clean water deficit and just under half of the sanitation deficit, with South Asia accounting for the bulk of the remainder. On current trends Sub-Saharan Africa will reach the water target in 2040 and the sanitation target in 2076 (United Nations, 2006). To get on track, connection rates for water will have to rise from 10 million a year in the past decade to 23 million a year in the next decade.

During the 1990s private participation was broadly hailed as the solution to developing countries' problems in the water sector. Private investors were expected to provide not only much-needed expertise but also the sizable funding required to rehabilitate infrastructure and expand coverage. The private sector investment boom of the late 1990s has been followed by declining investment flows and the cancellation or distress of several high-profile projects. Enthusiasm has been replaced by doubts. Contracts often reflected excessive optimism by both private investors and governments, and the socio-political difficulties of raising tariffs to levels covering costs were often underestimated. Financial markets were hesitant to provide non-recourse financing for water projects (unlike projects in other infrastructure sectors), often requiring that financing be backed by the sponsors' balance sheets. Finally, some of the largest water projects were in East Asia and Argentina, and when financial crisis broke out, the contracts proved insufficiently robust to weather the storm. Several international water operators lost much of their appetite for further investment in developing countries.

However, recent data paint a more nuanced picture. Activity in 2005 suggests that private participation in the water sector is entering a new phase. New private activity is focusing on smaller projects, a few countries, and bulk facilities. Contractual

arrangements involving utilities are combining private operation with public financing and new players are entering the market. Indeed, 2005 was a record year: 41 projects reached financial closure, the most since 1990.

Indeed, private investors committed US\$50 billion to more than 380 water infrastructure projects in developing countries in 1990-2005. In the past 15 years, 68 developing countries brought private participation to their water sector and by 2005, 54 of those countries still had operational water projects. And in the past three years, countries as diverse as Albania, Algeria, Ghana, Peru, and Russia have opened their water utilities to private participation. However, Sub-Saharan Africa was able to attract only 17 projects and 12 other projects combining water and electricity services. Even then, South Africa accounted for 7 of these projects.

Due to the high country risk in Sub-Saharan Africa, private operators had been reluctant to invest there even during the “concession boom,” leading to a predominance of management and lease contracts. As these schemes have proved to be more sustainable, such countries as Côte d’Ivoire and Senegal have become international success stories for private participation. In 2005, Vittens of the Netherlands won the management contract for Ghana’s national water utility in a consortium with Rand Water of South Africa.

Nowhere has privatization met more intense resistance in Africa than in water supply. There have been a number of effective campaigns against the privatization of water services in sub-Saharan Africa, notably in Ghana⁴, Kenya and South Africa.

4.2 Energy

Energy is critical to economic and social well-being. The provision of electricity is perhaps the most capital-intensive of all infrastructure activities, requiring massive investments in power generation, transmission, and distribution systems and other related facilities.

On attaining political independence, energy infrastructure was seen as an essential lever for economic take-off and social advancement of the citizenry, and governments would manage the operation, the planning, and the financing of this sector. The organisation of the sector was thus based on state-owned monopolistic operators and managed as government departments or a separate public company. Over the years the public monopoly approach facilitated the expansion of power suppliers and captured technical economies of scale. However, it failed to ensure high quality service, wide access to the service, and reliable supply; this led to poor investment decisions and precarious financial viability.

⁴ The most successful, perhaps, has been in Ghana, where the Integrated Social Development Centre (ISODEC), a Ghanaian NGO, led the coalition against water privatization. It was reinforced by research from Christian Aid and widespread support by academics and NGOs worldwide.

Since the 1990s, new ways of organizing the industry have begun to be explored. In an effort to improve the technical, commercial, and financial performance of utilities; boost sector cash flow; facilitate mobilization of resources for capital investment on a commercial basis, thereby releasing public funds for other investments; and extending access to electricity to poor and rural communities, many countries have adopted plans to reform the structure, operation, and financing of their state-owned electricity utilities. A number of African countries have adopted policies and plans to unbundle and privatize their power sectors and to introduce competition.

While the depth and pace of reforms in Africa have not been as extensive or as rapid as in many industrialized countries, a sizeable group of countries had taken several steps in the reform process, with considerable private sector involvement, both in IPPs and in divested assets.

Private participation has mainly been through management contracts, concessions, and new investments in independent power producers. Most countries are also establishing independent electricity regulators, and many power sector reform initiatives have also involved the establishment of electrification funds and agencies. It is noteworthy that most African governments moved to institutional reform of their power sector under pressure from the Internal Finance Institutions, which unanimously bundled institutional reforms with lending for investment to expand and renew power facilities.

Power sector reform has conventionally begun with an initial stage of commercialization and corporatization of state-owned utilities, which is followed by Unbundling and the introduction of competition. Although many countries have begun this reform process, no African country has completed the transition to a fully unbundled, competitive, and private electricity sector; in fact, so far only Uganda has successfully unbundled its utility. Some have introduced limited competition *for* the market by allowing bids by independent power producers ((Ghana, South Africa, Tanzania and Nigeria) or concession agreements (Mali, Uganda), but none have succeeded in developing competition *in* the market through a competitive power market or at the distribution level.

While past and ongoing reforms in the power sector in Africa have registered some encouraging results, especially improved generation capacity as well as financial performance in certain utilities, there are still a number of important challenges that are yet to be addressed. First, there is a need for sustained improvement in technical and financial performance in the electricity industry. In a number of African countries, the advent of PPIs has certainly improved the availability of power by boosting national installed capacity. In addition, in certain countries, changes ushered in by new management teams usually under some form of contract management arrangement has resulted in attitudinal changes, especially in respect of debt collection levels. The long-standing problem of poor performance at the transmission and distribution end, however, remains intractable. Undue emphasis has been Proportion of the problems facing many African utilities pertain to transmission and distribution.

Other challenges include increased electrification of the poor and, increased local participation in the power sector. The power sector in Africa has largely failed to provide adequate electricity services in support of economic growth and improved social welfare. With the exception of South Africa, Ghana and to a lesser extent, Zimbabwe, the majority of sub-Saharan African countries continue to register woefully low levels of national electrification. In most countries, rural electrification levels are in single digit levels and urban electrification levels still well below 50%. For lower income groups, access to electricity is still a dream. The emphasis on profitability appears to have relegated expanded electrification for the poor to the bottom of the priority list.

4.3 Telecommunications

Reliable, affordable and cost effective telecommunication infrastructure is not only a prerequisite for an information society, but also a key issue in the improvement of basic services and the achievement of the millennium development goals. Worldwide, information and communication technology (ICT) has accelerated dramatically over the past decade, spurred by an increasingly global economy, technological advances, increased competition, and the loosening of trade restrictions.

Investment in ICTs has grown substantially in both developed and developing countries. Despite some remarkable changes with recent reforms in the telecom sector across Africa, overall teledensities remain extremely low, with the rollout of fixed lines by incumbent operators barely inching forward in most countries, while the uptake of mobile telephony moves rapidly past. With about 12 per cent of the world's population, Africa has less than 3 per cent of the world's telephone lines. Fixed-line and Internet penetration is a little more than 3% and mobile penetration is at around 15%.

However, telecommunication sector reforms have triggered significant private investment in networking. In the past few years, a domino effect has occurred in Africa's telecommunications sector resulting in a flurry of reform activities. This puts the continent at par with developments in other regions.

The record of private participation in infrastructure in Sub-Saharan Africa has been largely one of telecommunications. Many countries are undergoing sectoral reform and foreign investment is now actively encouraged across the continent as privatisation and liberalisation are progressively being introduced. More than one-third of all state telecommunications companies have already been privatised and several more are set to undergo privatisation in the near future. Some of the biggest markets on the continent, including Nigeria and Kenya, privatized their national company in 2006.

Africa is currently the fastest growing mobile market in the world with about 50,000 subscribers every day. Fuelled by competition and the introduction of prepaid services, the growth of mobile phones and other wireless technologies in the past few years has been exponential, narrowing the digital divide. The number of mobile subscribers in Africa has

increased by over 1000 per cent between 1998 and 2003, to 51.8 million, according to the International Telecommunications Union (2004). The number of cellular users has long passed those of fixed lines, which stood at 25.1 million at the end of 2003. From just 8 million subscribers in 2000, estimates currently range from 100 to 130 million by the end of 2006.

Since Uganda attained the status of the first African country where mobile telephone subscriptions outnumber fixed-line connections, the number of mobile phones quickly outnumbered fixed lines in most African countries, and mobile users now constitute around 85% of all African telephone subscribers - a higher ratio than any other continent. Other wireless solutions are also used to serve as substitutes for inadequate fixed-line infrastructure and Internet access.

About 95 percent of African mobile subscribers use “pay as you go” model which is particularly suited to Africa, bypassing the problematic issues of billing and revenue collection.

There are currently more than 120 mobile networks in operation in Africa, compared with 33 in 1995. Regional and international players continued to jostle for positions in Africa’s lucrative mobile market throughout 2006 and consolidation is beginning to take hold. Particularly remarkable is the influx of Middle Eastern firms.

The most competitive markets are Algeria, Democratic Republic of Congo, Nigeria and South Africa with 3 or more operators. South Africa is Africa’s most developed market with market penetration rate of 67 % in 2006 followed by Tunisia. Despite falling tariffs, competition is still needed in some markets retaining monopolies such as Ethiopia and Rwanda, coincidentally still with the lowest penetration rates.

Celtel’s one network project in East Africa is the world’s first borderless or unified phone network. It offers subscribers in Kenya, Uganda and Tanzania with free roaming facilities across borders with airtime charged to their local currencies.

There have also been some noteworthy efforts to expand telecommunications to rural areas through the institution of universal service obligations (USO) and funds for rural communications development, and in setting targets for the provision of services and the quality and extent of national connectivity. In addition, providers of mobile telephone services have been licensed in almost all countries in Africa.

The use of the Internet has grown rapidly in most urban areas in Africa, in much the same pattern as the adoption of the mobile phone, which followed shortly after. As an indication, five years ago, only a handful of countries had local internet access; now it is available in every capital city. Each computer with an Internet or email connection usually supports a range of three to five users. This puts current estimates of the total number of African Internet users at 5-8 million, with about 1.5-2.5 million outside of North and South

Africa. This is, on the average, about 1 user for every 250-400 people, compared to a world average of about 1 user for every 15 people, and 1 in every 2 people in North America and Europe.

The Internet, however, remains out of reach to the vast majority of Africans and is still mostly confined to the larger cities and towns. By early 2004, overall Internet penetration in Africa was below 1.2 per cent. The lack of telecommunication infrastructure is the most important economic issue currently holding back Africa's development. Despite the availability of low-cost and efficient solutions, there remains a huge unmet demand for telephone connections. There is also a wide disparity between the various regions of the continent. For example, the five Maghreb countries and South Africa have more telecommunication infrastructure than all the 46 countries in sub-Saharan Africa.

At least five satellite operators are extending their coverage of Africa; and the WASC/SAT3/SAFE submarine cable link to Europe and Asia was begun in May 2002, providing transmission capacity of 80Gb/s and an ultimate design capacity of 120Gb/s. The lack of competing providers to route international traffic, combined with the over-dependence on satellite technologies and a regional market fragmented into low-volume national markets, has resulted in prohibitive prices for international traffic. This impedes the development of Internet use, as it creates high costs for limited bandwidth.

4.4. Transport

Transport infrastructure (roads, railways, sea, river and airports) enhances production and trade potential of local, national and regional economies. It also facilitates access to economic and social services essential for achieving the MDGs. Transport impacts on women in Africa, which explains why gender has begun to feature internationally as a recognised issue in transport policy and planning. Women carry the burden of transport in rural Africa. Providing effective and efficient transport infrastructure underpins all attempts to reduce poverty

Since the 1990s the transport sector has undergone a major transformation. The transport business has mostly been deregulated, and transport policies have been modified to permit market-determined decisions, enterprise autonomy, and private participation in the ownership and management of transport business. Most bus and trucking companies have been privatized, and governments are making concessions on the railways, ports and harbours, and airports, especially since 2000. Various forms of public-private partnerships have been tried in airports, seaports and railways, more rarely for roads. Investors' perception of high risk renders full privatisation impractical, so most private participation in transport infrastructure has taken the form of leases or concessions.

Private contractors are rapidly replacing force account in the rehabilitation and maintenance of roads and transport infrastructure. In addition, public enterprises have

been given considerable autonomy, and arbitrary regulation has been replaced by regulation through consensual performance contracts. In the highway sector, setting up of more sustainable institutions – autonomous road agencies and dedicated road funds – has become the norm, and in some countries has started to show positive results.

Nonetheless, Africa is still considerably disadvantaged in all respects in the transport sector. Under a fifth of its road network in Sub-Saharan Africa is paved, compared to over a quarter in Latin America and over two fifth in South Asia. Even paved roads are severely affected by systematic axle overloading of trucks and poor drainage, with dramatic consequences on safety. High transport costs handicap Africa's capacities to compete within a global market, inland transport costs are twice as high in sub-Saharan Africa compared to Asia; international maritime costs are three times higher. These higher costs are due to a combination of factors such as lower road quality, outdated port facilities, time-consuming administrative procedures and in some countries, insufficient competition between service providers.

Despite the importance of airports and seaports for long distance freight, only a few airports (in Egypt, Cape Verde, Ethiopia, Morocco, Ghana and South Africa) have attained FAA Category I status, required for international flights. Only 4.5 per cent of global air traffic is in Africa, yet its share of accidents reached 25 per cent in 2004. Only one African seaport is owned by one of the five largest global port operators known worldwide for their efficiency and most container terminals are reaching or have reached capacity limits, and are under-equipped. Even Durban has had a congestion surcharge imposed by shipping lines for two years (Goldstein and Kauffmann, 2006).

5. Conclusion

There has been a “policy mistake” founded on the dogma of the 1980s/90s that infrastructure would be financed by the private sector. For various reasons, mainly involving investment climates and rates of return, private investment has been limited in terms of volume, sectors and countries. Roughly only one third of the developing countries can count on private sector operators for the delivery of electricity, water, or railways services. The largest presence is in the fixed line telecoms business where about 60% of the countries rely on private operators. Overall, the private sector has roughly contributed to 20-25% of the investment realized in developing countries on average over the last 15 years or so. In Africa, it has probably contributed less than 10% of the needs (Estache and Goicoechea, 2005). This is not to deny the presence of the private sector. In fact, where the state and the large private sector have failed to deliver the services, the small scale, generally local, private sector has filled the gap.

So far, the region's track record of investment suggests that the private sector by itself is unlikely to provide the kind of near-term funding needed to address these shortcomings. With Africa's low levels of infrastructure investment in the face of rapidly growing needs, the private sector appears capable of supplying only a fraction of the estimated US\$5-12

billion a year in additional infrastructure finance that Africa needs to meet its Millennium Development Goals for infrastructure.

The financial resources required for this task must come from governments, other official sources, and, increasingly, from private capital markets. The two approaches on which reform hopes have been based have both proven deficient, though in different ways. The revised tactics require further revision. The search for mechanisms that combine private capital and expertise with socially acceptable management and delivery must be renewed.

A step-change in approach is required to meet urgent needs and address the scale of the problem. Getting the policy fundamentals right will require a stronger focus on competitive market structures, cost-covering tariffs, and credible governance frameworks for private investors.

But to begin solving Africa's infrastructure investment problems will also require broad institutional reform, along with greater financial commitment by governments and the private sector. Private participation in infrastructure is not only about financing, it is also more importantly about capacity building, transferring better technologies, innovations and removing capacity constraints to implementation. It requires fiscal reform and improvements in public sector management. It also requires careful attention to the basics of project design, including identifying and allocating risk and ensuring sound procurement practices. Developing successful projects requires some things in short supply in the developing world—time, money, and sophisticated skills. Moreover, private participation does not always work well in every infrastructure sector or every developing country.

Africa's shortfall is partly due to shrinking public budgets for infrastructure. The need to sustain or in most cases significantly increase the proportion of GDP allocated to infrastructure investment has therefore become imperative. This has a number of dimensions; including the reorientation of current spending towards investment, improving the efficiency of procurement and management of public funds, and the possible reassessment of public spending priorities.

Improving the capacity of the local financial markets to mobilise resources will be an important part of a sustainable financing strategy. As in other regions, project sponsors in Africa have in recent years sought to increase local financial markets' contributions to the debt funding of infrastructure projects that generate mostly local currency revenues. These efforts have led to some local currency loans and bonds, mainly for telecommunications projects. But a larger share of local currency financing would be desirable. Progress in financial sector reform could make this feasible, as local banks build capacity for project finance and capital markets become more liquid.

Regional approaches to infrastructure development are probably more important than previously recognized. Africa is highly fragmented with a large number of small economies, many of which are landlocked. Regional infrastructure offers the opportunity

for cost reductions through economies of scale, making infrastructure more affordable. However, regional infrastructure projects are proving difficult to realize in part due to the size of financing requirements and the complexity of multi-country transactions. In many cases, an active catalyst will be required to move a regional project forward. Careful co-ordination with regional and continental authorities (such as the NEPAD) rationalises state action on cross border projects, while offering the country benefits from larger markets.

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