



Sustainable Infrastructure Development in Sub Saharan Africa: A View from the Ground

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Introduction

The objective of this policy brief is to discuss issues affecting sustainable infrastructure development in Sub-Saharan Africa (SSA)² countries including challenges, opportunities, and investment options facing SSA countries.

Sustainable infrastructure refers to the designing, building, and operating of infrastructure³ projects taking into account social, economic, financial, ecological and environmental considerations. Sustainable infrastructure enhances quality of life for citizens, helps protect vital natural resources and environment, and promotes a more effective and efficient use of financial resources.⁴

Infrastructure development and financing are an indispensable component of growth for any economy, and are an essential building block for SSA countries to get on the path of sustainable development. However, at present, SSA countries lack adequate and sustainable infrastructure to support increased economic growth.

Overall and by all indicators, SSA is the least endowed region of the world in terms of infrastructure, even when compared to low- and middle-income countries in other developing regions. Moreover, private sector investments in SSA infrastructure remain among the lowest in the world. This is due to a number of contributing factors, including small country size that affects

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² Sub-Saharan Africa refers to the definition of the World Bank which includes 48 SSA countries: Angola, Benin, Botswana, Burkina Faso, Capo Verde, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep, Congo Rep, Cote d' Ivoire, Equatorial guinea, Eritrea, Ethiopia, Gabon, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

³ The term “infrastructure” refers to energy (including power, oil, gas and mining), information and communications technology (ICT), transportation, water supply and sanitation and urban services.

⁴ Montgomery, Robert. 2015. How can we promote sustainable infrastructure? World Economic Forum.

economies of scale and service delivery costs; low incomes that constrain affordability; weak institutions; underdeveloped domestic capital markets resulting in lack of locally-denominated long term capital; and relatively poor business environments. Closing SSA's infrastructure gap would thus require a multi-track approach to increase all forms of public and private investments and leverage a variety of financial instruments, including guarantees.

Background

Infrastructure services in SSA countries can easily cost twice as much as in other developing regions due to lack of economies of scale and limited competition. According to the Infrastructure Consortium of Africa (ICA)⁵, infrastructure makes up a major part of investment expenditure in SSA, equivalent to roughly 3 to 6 percent of GDP per year (one-third to one-half of total public investment). And yet, the poor state of infrastructure in SSA countries continues to impede growth, trade and poverty reduction. The World Bank estimates that it reduces economic growth by 2%, and business productivity by as much as 40%, every year.⁶ On the other hand, as examples, improving Kenya's infrastructure up to the level of middle-income countries, would boost annual growth by more than three percentage points and for Nigeria, this would mean an increase in annual real GDP growth by around four percentage points.⁷

A synopsis of the infrastructure sector based on various World Bank, Africa Development Bank and ICA reports⁸ indicates:

Energy

- Low access, low supply and high cost. Despite a large endowment of energy resources. SSA's power generating capacity is lower than any other region (total SSA output (68 GW), is roughly equal to the generation capacity of Spain).
- Almost 70% of the population, and 10 million SMEs, have no access to electricity.

⁵ Infrastructure Consortium of Africa. 2013-15. *Infrastructure Financing Trends in Africa*. Abidjan.

⁶ Foster Vivien and Briceno-Garmendia Cecilia. 2010. *Africa's Infrastructure: A Time for Transformation*. The World Bank. Washington D.C.

⁷ PWC. 2014. *Trends, challenges and future outlook*. Capital projects and infrastructure in East Africa, Southern Africa and West Africa. PWC Africa.

⁸ African Development Bank. 2014. *African Development Report 2014*. Abidjan; African Development Bank. 2013. *Africa Infrastructure Development Index*. Abidjan; Infrastructure Consortium of Africa. 2013-15. *Infrastructure Financing Trends in Africa*. Abidjan; Foster, Vivien and Cecilia Briceno-Garmendia. 2010. *Africa's Infrastructure: A Time for Transformation*. The World Bank. Washington D.C.; Infrastructure Consortium of Africa. 2013-15. *Infrastructure Financing Trends in Africa*. Abidjan.

Water

- Only about 15% of households receive piped water through household connections (15% through stand posts, 37% through wells and boreholes, with most of the remainder—30%—relying on surface water).
- Waterborne sewerage systems are rare—only half of SSA’s large cities have sewerage networks.

Transport

- Road systems are grossly inadequate—of the 50,000km of trans-African highways, 30% are unpaved and 50% are in poor condition.
- Ineffective linkages between different transport modes (air, road, and rail), declining air connectivity, poorly equipped ports, ageing rail networks, and inadequate access to all-season roads are key problems.
- Red tape slows freight below 12 kilometers an hour even though truck speeds can be 60 km/hour.

To unleash the continent’s enormous potential—both within SSA countries and in global markets—it is critical that SSA countries address the infrastructure constraints that increase the costs of trading and reduce competitiveness. But this is only part of the solution. Countries will have also put in place the necessary reforms to remove policy-related barriers to trade that affect all stages of the value chain.

Sustainable infrastructure development is a comprehensive effort. It requires the “hard” components of roads and railways, power plants and water treatment facilities. In SSA countries in particular, these must be accompanied by effective service delivery that brings the benefits of expanded infrastructure to the people who need them most. But sustainable development also requires the “soft” components that touch every part of hard infrastructure: an abiding respect for the environment, an understanding of how communities and societies evolve and the role of people and citizens within them, and continuous engagement to support macroeconomic and sectorial policy reforms to ensure that investments result in greater access to better quality, affordable, and sustainable infrastructure for all.

Determinants of Sub-Saharan Africa’s Growth Trajectory and Sustainability

The Sustainable Development Goals provide a clear global mandate to address poverty, including on the African continent. Today 390 million people still live in extreme poverty in SSA countries. Relatively robust levels of growth in SSA over the past twenty years have not reduced poverty as much as in the rest of the developing world. The effectiveness of growth in lifting Sub-Saharan Africans out of poverty—the continent’s “growth elasticity of poverty”—is three times less than in the rest of the developing world. One percent of GDP growth cuts poverty in SSA by 0.7 percent; compared to an average 2 percent in other developing regions⁹.

⁹ World Bank. 2014-2015. *Africa’s Pulse. An analysis of issues shaping Africa’s economic future*. Washington D.C. Infrastructure and Sustainable Development; Korea-World Bank High Level Conference on Post-Crisis Growth and

One reason is that growth has been lagging in labor intensive sectors such as agriculture and manufacturing, which are typically more poverty-reducing than growth in capital intensive sectors such as extractive industries and mineral exploitation. Moreover, except in fast-growing resource-rich countries, SSA's growth appears to be driven by factor accumulation, rather than improvements in productivity and in competitiveness.

Fragility and conflict pose another significant downside risk, with extremist and militant groups posing new types of threats. In addition to affecting security, these have adverse impacts on employment-generating sectors and limit the execution of development programs and infrastructure projects in the often-poorest regions of the continent. Increased competition for scarce resources is also a source of conflict.

SSA now faces new challenges. The end of the commodity super-cycle creates headwinds for many countries in the region. As a result of falling oil and other commodities prices, SSA growth is expected to grow at 1.6% in 2016, the lowest rate for over 20 years.¹⁰

The current situation suggests that SSA's development trajectory needs to be viewed through four interrelated lens—infrastructure, public and private sector investments and partnerships, human capital, and inclusiveness—and that concerted and consolidated action needs to be taken along all four.

Infrastructure for Economic Growth

The first “lens” is infrastructure for economic growth. It is very clear from the literature that no country can achieve sustained increases in GDP without spending on infrastructure, whether for energy services, water treatment plants, roads, railways, ports and airports, telecommunications, urban services, rural facilities, or environmental protection. SSA is no exception.

The ICA and the World Bank¹¹ estimate that in order to maintain current levels, spending on SSA's infrastructure will cost around US\$100 billion per year over a decade, split evenly between investment and maintenance. This is about double the current spending levels¹². At present, around half of the financing comes through government spending and the rest from loans and grants from International Financial Institutions, China, and other development partners.

Development June 3, 2010 – June 4, 2010. Busan, Korea; Calderon, César, and Luis Servén. 2010. “Infrastructure in Latin America”. *The Handbook of Latin American Economies*. World Bank.

¹⁰ The World Bank. 2016. State of the Africa Region, World Bank – IMF Annual Meetings. Washington D.C.

¹¹ Vivien and Briceno-Garmendia. 2010. *Africa's Infrastructure: A Time for Transformation*. The World Bank; Infrastructure Consortium of Africa. 2013-15. *Infrastructure Financing Trends in Africa*. Abidjan.

¹² International Monetary Fund (IMF). 2014. Regional Economic Outlook: Sub-Saharan Africa—Staying the Course. Washington D.C.

Policy makers, private and public investors in SSA countries consistently rank infrastructure as their top priority, yet they are unable to do as much as they would like¹³. The poorest countries need to spend about 9% of their own GDP to operate, maintain, and expand infrastructure services. Currently they are probably spending about half that amount, collectively, with enormous disparities from one country to another. For instance, Angola, Cabo Verde, and Lesotho invest more than 8 percent of GDP, while oil-rich Nigeria and fragile South Sudan allocate less than 1 percent¹⁴.

While national infrastructure is crucial, regional inter-nations infrastructure is also of strategic significance to SSA. Numerous missing links in the continent's infrastructure backbones prevent it from harnessing scale economies, stymie the development of small and landlocked countries, prevent optimal use of common hydrological resources, and block the use of efficient trade corridors and least-cost regional service solutions. Completing these critical regional SSA infrastructure networks would take according to the World Bank about \$7 billion annually of capital investments. But both preparing bankable regional infrastructure projects and implementing them is challenging. Regional projects involve multiple countries, a variety of stakeholders, and often differing legal, financial, and regulatory environments. Given the scale of the investment required, regional projects also often involve multiple public and private financiers who have varied information needs at different points in the project preparation process. The complexities of these projects mean that careful coordination is needed to ensure that transactions are efficient and effective.

Private Sector Investment and Public, Private Partnership

The second “lens” is more significant role for the private sector in infrastructure. SSA countries have no choice but to increase private investment if they want to improve infrastructure. However, the private sector's share of total infrastructure spending continues to be lower in SSA than in other regions in the world. At present, it is under 4% of the total financing, significantly less than in other low and middle income countries. It is also mostly concentrated in ICT and power generation. Except for few countries including Kenya, Nigeria, and South Africa, SSA countries have been unable to attract significant private investment outside the telecommunications and power sectors. In 2013, SSA received about \$17 billion in private funds, of which all but \$2 billion went to South Africa and Nigeria in sectors other than telecommunications.¹⁵

While many institutional investors seek stable, long-term, income streams from already existing and operational projects, they tend to avoid the level of risk that is generally associated with new projects. The challenge is to find new ways for the public sector to improve underlying investment

¹³ PWC. 2014. *Trends, challenges and future outlook*. Capital projects and infrastructure in East Africa, Southern Africa and West Africa. PWC Africa.

¹⁴ International Monetary Fund (IMF). 2014. *Regional Economic Outlook: Sub-Saharan Africa – Staying the Course*. Washington D.C.

¹⁵ International Monetary Fund (IMF). 2014. *Regional Economic Outlook: Sub-Saharan Africa – Staying the Course*. Washington D.C.

conditions and expand private and public infrastructure project pipelines to reduce risk and catalyze additional financing from different sources, including the private sector.

Another major challenge with increasing private financing for infrastructure in SSA is the shortage of investors willing and able to assess and take on the long-term additional risk associated with large and complex projects. Large infrastructure projects have long gestation periods and often require complex feasibility studies and expert transaction advice. The costs of preparing large-scale infrastructure projects amount to between 7 and 10 percent of the project's final investment costs. This sort of finance is currently not available from development partners or from Sub-Saharan African governments, and private investors are reluctant to commit to the full infrastructure development costs. Thus, Public Private Partnership (PPP) would be a win win solution.

The potential sources of funding for investments vary considerably according to both the type of infrastructure asset and the circumstances of the country or countries in which the investment would take place. Unfortunately, a high share of unmet investment needs is associated with types of assets for which it is difficult to raise private finance. The bulk of the requirements lie in sectors that are more difficult to fund, such as water supply, power transmission and distribution, hydropower, geothermal, and medium to low traffic roads.

Moreover, exchange rate risks, commercial or demand risks, regulatory risks, project bankability/viability, internal capacity limitations, access to funding, political instability, policy incoherence, reported corruption, and a debilitating shortage of capacity and skills, all act as strong disincentives for a significant expansion and participation of the private sector, and increase the cost of infrastructure private sector led projects. These risks are typically accounted for in estimates of the minimum rate of return that private operators want from a deal in a given country. Ultimately, these risks reflect problems of governance that go beyond infrastructure. Until and unless these risks are reduced, minimum rates of return on private investment will be raised.

On the positive side, new foreign, as well as local and regional, investors and funds are now developing on the continent. In addition, sources of domestic revenue is slowly broadening. From 2006 to 2014, 13 SSA countries issued a total of \$15 billion in international sovereign bonds, often intending to use the proceeds to finance infrastructure¹⁶. SSA pension funds have about \$380 billion in assets under management, 85 percent of which are in South Africa. In countries, such as Cabo Verde, Kenya, South Africa, Swaziland, Tanzania, and Uganda, funds are investing in infrastructure¹⁷. SSA funds can send a signal with regard to perceptions of risk, through their better understanding of local context, but can also make use of closer ties to guide Governments on how to structure and regulate infrastructure projects to facilitate institutional investment. Much more could be done to link and leverage these new investors and funds.

¹⁶ IMF. 2016. Finance & Development. Amadou Sy. *Impediment to Growth*. Washington D.C.

¹⁷ Inderst, Georg, and Fiona Stewart, 2014, *Institutional Investment in Infrastructure in Emerging Markets and Developing Economies* (Washington D.C. World Bank).

Experience shows that while private finance could make a sizeable contribution toward meeting the overall need for investment, the bulk of financing requirements are in country environments where attracting private finance will be more difficult. There are not enough private sponsors with the capability, balance sheets, and risk tolerance to provide a strong competitive environment for large, complex, national and regional projects. This is particularly true when country risks are high, and is aggravated by traditional procurement policies of development partners that may provide a disincentive for developers to spend money in advance of a costly tendering process.

In sum, while private finance will undoubtedly need to increase if SSA is to meet its infrastructure targets, a significant increase in public funding and PPP will also be needed, especially in sectors with the most immediate impact on poverty reduction and in countries with the greatest needs.

Human Capital Growth

Building infrastructure is an absolutely necessary condition to achieve sustainable development and inclusive growth. But it is not sufficient. Which is why the third focus “lens” of human capital is so important.

SSA governments have limited capacity to implement a large-scale increase in investment and reform in the infrastructure sectors. At the country level, many governments and service providers do not have sufficient expertise, human capital or resources to successfully implement the needed large increase in infrastructure services. In order for countries to take advantage of investments in physical infrastructure capital and enable the private sector to flourish, investments in human capital are also critical to sustain economic growth. The importance of education and human capital has been brought out in many impacts studies of economic growth¹⁸ and infrastructure development.

SSA is the world’s youngest continent, with more than 50 percent of the population under the age of 25. According to the World Bank, every year for the next decade, it is expected that 11 million young people will enter the job market. This demographic dividend offers a tremendous opportunity for SSA countries to build the skilled workforce that will serve as the engine for the economic transformation of the continent and help build a sustainable stock of infrastructure. However, it represents a “dividend” only if these young people are educated in infrastructure related sectors, trained, and employable, and if jobs can be created.

The reality is that there is a mismatch between what SSA students are learning at school and university and the skills employers are actually looking for and in particular in infrastructure related sectors such as power, water, ICT and transport. Unless addressed, this gap is likely to widen as technology assumes an ever-greater role in production systems, service industries, and entrepreneurship.

¹⁸ Barro, Robert. 1991. Economic Growth in a Cross Section of Countries. *Quarterly Journal of Economics* 106(2) p. 407-414.

Inclusive Growth

While expanding infrastructure, increasing private sector and building human capital are required for growth, the fourth “lens”, inclusive growth (i.e., economic growth that can facilitate a meaningful and sustainable poverty reduction¹⁹), is essential to reduce poverty and inequality. Calderon and Serven’s (2010) finding that increased infrastructure quantity and quality reduces inequality is not surprising.

Infrastructure can have a strong impact on the incidence and depth of poverty by supporting inclusive growth. Infrastructure development achieves this by: (i) improving access to key facilities; (ii) creating additional jobs and economic activities, (iii) expanding the overall production capacity; (iv) reducing production costs through improvements in transport and connectivity, and (v) connecting markets and other economic facilities. As infrastructure is developed and growth appears, the nature of the influence of infrastructure on growth and poverty reduction will change.

The impact of infrastructure on inclusive growth also depends on whether a country practices good governance (especially in the management of development), and the adequacy of its health and education expenditures, which determine how people can respond to increasing economic opportunities.

In addition, inclusiveness and sustainable growth relate to the degree to which the infrastructure service associated with particular assets leads to the co-benefits reaching the largest segment of the population aiming at: (a) improvement of welfare, especially for the poor; (b) balanced development between rural and urban areas; (c) gender considerations; and (d) dismantling barriers within the country.

Sustainable Future

The broader business climate is essential for SSA to realize its growth potential. Beyond affordable and efficient infrastructure, and associated risks, issues such as access to credit, integrity of property rights, permit and land requirements, trade regulations and logistics, open procurement policies, and costs of starting a business are among the important investment climate indicators that can attract—or deter—investors in SSA.

Governance remains a concern in a number of countries—whether it is petty corruption, social accountability to citizens, or building transparent systems of procurement and public financial management. Continued improvements in rule of law, accountability of institutions, and access to information will further help to build investor confidence and spur greater growth. But all in all there is need to recognize that Governments in many SSA countries have come a long way in developing policies conducive to sustainable development, often under extremely challenging circumstances. They are increasingly trying to reconcile infrastructure investment, financial constraints, economic growth and environmental protection. For instance, this link between

¹⁹ World Bank. 2009. *What is Inclusive Growth?* Note prepared by PRMED Policy Advisory Group. Washington D.C.

infrastructure investment, environmental protection, and social development can best be seen in the energy sector, where a lot of countries are working towards a “double dividend”: striving to meet the energy needs that are essential to fuel growth and fight poverty on the one hand, while preserving and enhancing the environment and protecting communities on the other.

Policy Recommendations

Three key themes have emerged from this note that represent fundamental requirements for sustainable infrastructure development and increased private sector investment in SSA: (i) improve the financial and business environment for infrastructure investment in SSA countries; (ii) develop institutional capacity and technical skills to prepare bankable projects and manage them; and (iii) match financing approaches with the different needs. These three categories are, of course, inextricably linked; policy reform, increased funding, better preparation, and improved management and delivery all leverage each other. Policy reforms can stretch available investment funding, lower investment risks, and attract more funds.

Improve the financial and business environment for infrastructure investment

Observations and fact findings indicate that lack of longer-term financing options in domestic currency lead to a focus on short-term investments, while limited local capital markets are unable to address financing needs of larger core infrastructure projects.

The rules governing business creation, operation and taxation are major factors determining whether or not an investment can be closed and often whether or not the subsequent operation of the facility will be successful. Improving the business environment involves many aspects, but normally would include the following that are specific to infrastructure financing:

- Review infrastructure sector organizational structures and tariffs
- Improve Public Private Partnership (PPP) frameworks at the national and sub regional levels
- Review the effect of national and regional tax policy on private infrastructure investment
- Review intergovernmental framework reforms and regulatory set up to promote sub-national and regional infrastructure.

Develop a more robust and diversified pipeline of bankable core infrastructure projects and ability to manage them.

- Infrastructure agencies and project preparation framework and facilities in SSA are not developing a sufficient number of well-prepared core bankable infrastructure project opportunities that are of sufficient interest or attractiveness to private investors. In fact, a key bottleneck facing large- scale regional infrastructure development in SSA today lies in the shortage of resources and institutional capacity to support project preparation. Project preparation encompasses a wide range of activities that have to take place before a project can be of interest to potential financiers. It includes the whole gamut of institutional, legal, political, financial, regulatory and engineering studies that are needed to go from an interesting concept to a clearly defined and properly structured project, with clear

identification and allocation of risk, is referred to. In terms of the overall project preparation costs, the engineering feasibility studies are one of the largest components. To improve the development of project pipelines, governments would need to:

- Develop systems within each sector agency for project selection, screening and prioritization
 - Adopt clear processes for annual budgeting of funds for project preparation.
 - Test systems to recover the costs of project preparation
 - Develop projects in conjunction with explicit PPP frameworks
- Successful infrastructure development requires much greater capacity within institutions to support core infrastructure project development, finance, operations, and maintenance. This is in addition to the significant additional funding of project preparation and associated technical assistance that is needed.
 - Building skills and developing human capital to improve the quality of indigenous project preparation and governmental decision-making is vitally important. This will require the sustained commitment and cooperation of development partners and host governments.

Adopt different financing strategies to correspond to the size and scale

- Different types of infrastructure projects require different financing model and instruments:
 - For large-scale national or transnational projects, multi-national and large domestic commercial banks, investment banks, IFIs, and large international and domestic debt and equity investment funds and facilities have the asset bases and expertise to play leading or substantial supporting roles in a project's financing.
 - For small and medium-scale projects of local and regional scope, a different mix of institutions is likely to be more appropriate, including domestic commercial and investment banks, domestic equity, debt funds and facilities, and pooled lending facilities.
 - For very small projects and projects of neighborhood and village scale, still another range of institutions can often be the most useful, including pooled lending facilities, small and medium sized enterprise equity and debt institutions, and micro-finance institutions.
- New infrastructure funds and facilities need to be developed or enhanced and focus initially on a limited number of countries and sectors, given the differences among the countries of SSA. A detailed understanding of how infrastructure systems operate within each country, as well as the tax and regulatory environment, is essential to making successful investments in core infrastructure. Pension funds need to be more channeled into financing infrastructure.

- Infrastructure facilities with no fixed exit date are institutionally appropriate for providing longer-term debt to infrastructure projects.
- Bond pooling is designed to reduce the cost of market-based financing of small projects.
- Local currency financial intermediaries or pooling facilities can often more efficiently finance small and medium scale projects. Several countries have set up financial intermediaries that lend to commercial banks on the condition that they use the funds for on-lending for infrastructure projects with longer tenors than otherwise available.
- New funds and facilities that extend exit time horizons are important financing options, along with expanded use of partial risk and partial credit guarantees, put options, liquidity facilities, take-out facilities and other techniques in support of locally denominated, longer tenor debt.

Conclusion

Governments in SSA are not investing enough in sustainable infrastructure where there are tremendous needs. Investment is currently at 2%-3% of GDP. Under-investment in infrastructure will have a negative impact on potential economic growth, living standards, and private sector development. At the same time, the private sector has not been able to fill the investment gap. The private sector continues to be a very important contributor to SSA infrastructure development. In addition, new modalities of private investment—especially from local and, international neighboring country investors, local currency financial intermediaries, and investment and pension funds—are emerging. In general, private sector discipline and financing have had a positive impact on infrastructure service delivery in SSA, and much more is needed to sustain economic growth.

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