Overview

Over the last few decades, infrastructure investment and delivery in developing countries have witnessed significant changes. For example, in Africa, governments, together with development partners, are adopting new and efficient ways of addressing the huge backlog of infrastructure stocks in areas of electricity access, clean drinking water, improved sanitation services, quality education, and improved health services. For example, in terms of financing, public-private partnerships and other co-financing mechanisms are being explored to leverage private capital resources to accelerate infrastructure investments. Similarly, new developments such as multi-sectoral as well as corridor/regional integrated solutions to infrastructure development are gaining traction.

In the past, infrastructure was delivered and managed in silos or on a sector-by-sector basis. However, there is a gradual transition towards more integrative cross-sector infrastructure delivery models in recent years. Besides the
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benefits of cost savings of scarce resources, this transition stems from the realization that a ‘business as usual’ approach to infrastructure development will not only stall the continent’s economic and inclusive efforts but also delay its industrialization agenda. In addition, “hard” infrastructure projects that integrate social infrastructure and “soft” components have been found to have broader development impacts and to bring greater benefits in terms of the population’s well-being.

This paper, part of IDEV’s “Lessons learning” series presents the lessons on infrastructure development drawn from IDEV evaluations and discussed during the IDEV webinar on “Fostering Integrated Solutions for Sustainable Development Impact: Lessons from IDEV’s Evaluations.” The paper briefly highlights Africa’s infrastructure development challenges and Africa-wide efforts aimed at addressing them, documents experiences of integrated solutions to infrastructure development, reflects on the experiences of the African Development Bank Group (“AfDB” or “the Bank”) through the lens of the Independent Development Evaluation (IDEV) and draws key lessons for future integrated infrastructure development projects.

Meeting Africa’s Infrastructure Challenge

Infrastructure remains a fundamental precondition for Africa’s socio-economic development. It contributes to over half of the region’s economic growth, underscoring its potential to contribute to economic and inclusive growth significantly. Within the context of the continent’s poverty reduction and industrialization agenda, infrastructure has been identified as a critical enabler.

That said, African governments continue to grapple with a huge mismatch between demand and supply of infrastructure. The supply of infrastructure has not kept pace with rising demands, particularly in low-income and fragile countries. This challenge is further compounded by deficiencies in existing infrastructural stock, resulting in huge deficits regarding access to reliable electricity, improved roads, potable water, and others. For example, in the energy sector, the electricity access rate for African countries remains the lowest compared to the rest of the world, just over 40 percent. Furthermore, compared to the rest of the developing world, access costs for infrastructural services remain high in Africa. In rural Africa, these challenges are more pronounced than in urban areas, with access to basic social services in urban areas estimated at five to ten times higher than in rural areas.

Recent estimates put the continent’s infrastructure needs at US$130–170 billion annually, with a financing gap in the north of US$68–108 billion. Investments are needed to connect about 600 million people to electricity while improving physical connectivity as well as water and sanitation for tens of millions of Africans.

This need underscores the urgency to accelerate investments and improve delivery innovatively. Cognizant of the low level of infrastructure vis-à-vis the need to improve physical connectivity and fully optimize the benefits of regional economic integration in the region, frameworks such as the Africa Union’s Agenda 2063 have highlighted the importance of infrastructure. When it comes to closing the infrastructural gap, the Bank and other continent-wide initiatives, including the Programme for Infrastructure Development in Africa (PIDA), are banking on effective public-private partnerships and other co-financing mechanisms to address the road transport demand. Over the last decade, infrastructure investment has seen a boost as governments and their development partners explore various financial options to help bridge the infrastructure deficits. The Infrastructure Financing Trends in Africa 2017 report, for example, indicates that

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1 See African Economic Outlook 2018. AfDB.
the continent’s infrastructure financing saw a boost in 2017, reaching US$81 billion, representing an increase of 22% on the 2016 value.4

Similarly, the AfDB is stepping up efforts in addressing Africa’s infrastructure challenges through its Ten-Year Strategy (2013–2022) and High-5 agenda (2016–2025) designed to place the Bank at the center of Africa’s transformation and to improve the quality of Africa’s growth. For the Bank, investing in infrastructure will unlock the private sector’s potential, boost investment, and stimulate entrepreneurship. Between 2008–2012, Bank support for infrastructure projects and programs totaled US$ 17.4 billion, accounting for approximately half of its overall support.5 Of this, energy sector support accounted for 44.1 percent, followed by the transport sector (42.5 percent), water and sanitation (12.3 percent), and ICT (1.1 percent).

Towards Integrated Solutions for Public Infrastructure Interventions

For decades, infrastructure interventions in Africa have been characterized by fragmentation, mostly focusing “…on sector-specific interventions rather than spatially synchronizing and concentrating the provision of different infrastructure services in larger “bundles.”6 Meanwhile, the vast financing gap for infrastructure investment demands that Africa fast-tracks its efforts by adopting integrated solutions that minimize infrastructure interventions’ costs, ensure sustainability and maximize their development impact.

In recent years, these new developments are emerging in African countries to “…meet the demographic and economic megatrends as well as to address the ubiquitous bottlenecks in the project cycle.” Continent-wide efforts such as PIDA are amongst efforts promoting such practices on a larger scale. For instance, PIDA phase 2 aims at “…the creation of ecosystems beyond single projects that include integrated economic corridors, global, regional or local value chains, and linkages of urban and rural economies.”7 Rather than just constructing a road in a rural and economically disadvantaged region, other socio-economic interventions should be incorporated based on a deliberate needs assessment.

Compared to stand-alone infrastructure projects, there are several benefits that accrue to using integrated solutions for delivering infrastructure. First, integrative approaches “…allow for the optimization of the environmental, social, and economic challenges and opportunities associated with infrastructure development, by considering the services that infrastructure systems deliver, and not just the assets created.”8 Second, applying such integrated solutions deliberately right from project/program design increases their bankability and attractiveness to investments.

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In addition, in rural areas where infrastructural services are limited, delivering infrastructure with a multi-sector lens brings “…higher returns for beneficiary households compared with scenarios where services are provided individually.” Finally, given the continent’s huge infrastructure financing gap, using integrative approaches from a sectoral standpoint also offers opportunities for economies of scale, just as is the case for regional corridor projects in the transport sector.

**IDEV Evaluations Findings on Adopting Integrated Solutions for Infrastructure Development**

**The case of AfDB’s Fufulso-Sawla Road Project in Ghana**

The Fufulso-Sawla Road Project (FSRP) stands out as a flagship one in terms of its inclusive and integrated design for providing a holistic response to the socio-economic needs of the beneficiary districts. It aimed to implement other socio-economic infrastructure (water, health, education, and social protection) besides constructing a 147.5 km road (Figure 1). For instance, as part of the ancillary works, the project sought to increase access to potable water, improve local market infrastructure as well as facilitate women groups’ access to agro-processing equipment and marketing opportunities.

The evaluation had 16 main findings. To highlight a few, the evaluation found positive impacts of the Fufulso-Sawla Road Project on: travel time and traffic density in beneficiary communities; market conditions and market integration; the development of new businesses; access to quality water and sanitation; household incomes; health and education outcomes; poverty reduction; and social cohesion among communities along the road. In addition, the intervention benefited women and girls specifically, albeit to a lesser degree than men. However, these positive development outcomes were highly unlikely to be sustained due to deficiencies in design, capacity, maintenance, and community engagement and ownership.

Most importantly, the ancillary works generated a proportionately greater additional effect than their additional costs (8.2 percent of the total project cost). As indicated, road construction alone was estimated to have led to a statistically significant reduction in the Multidimensional Poverty Index (MPI) among beneficiary households by 2.16 percent in 2015. Households that benefited from a school

**Figure 1:** Geographical distribution of ancillary interventions along the Fufulso-Sawla road in Ghana
in addition to the road experienced a significant additional reduction in the MPI by another 0.54 percent (to 2.7 percent), or 20 percent of the total effect. Finally, the construction of a market in addition to the road led to an additional statistically significant reduction in MPI by 0.39 percent (to 2.55 percent), or 15 percent of the total effect. The ancillary works thus generated a proportionately greater additional effect on the MPI than their additional cost.

Toward an integrated view of urban water cycle components

IDEV’s evaluations in the area of water constantly point to the need to adopt a holistic approach (integrated water management) to urban improvement, including in slums, which are seen as integral to the city. In other words, an appropriate balance is necessary between investing in water supply, sanitation and health education components to maximize achievement in urban water results. For example, in Mauritania, approximately three-quarters of consumed potable water is transformed into wastewater, which requires an appropriate sanitation system (AfDB/IsDB, 2013).

Investments must be balanced between production, distribution, and connection of water supply systems and institutional support measures. Institutional support is critical as the water utilities constantly come under pressure from stakeholders, including partners, governments, and customers, to improve the efficiency and effectiveness of their service delivery, notably for state corporations. Yet urban water supply investments have received neither the necessary institutional support nor efficient commercial and financial management capacity to ensure the delivery of sustainable services in the medium to long-term. Some success experiences from AfDB and IsDB funded projects that incorporated support to restructuring the water utilities in Cameroon (CAMWATER) and Burkina Faso (ONEA) illustrate the need to include an institutional component in water supply projects. Holistic approaches avoid double or multiple investments and speeds sector development, as shown by the Mauritania Nouakchott City Drinking Water project (AfDB/IsDB, 2013), a tangible example where institutional support was not sufficiently taken into account. An evaluation of European Investment Bank (EIB) financing of water and sanitation projects outside the European Union similarly concludes, “The Bank should not only focus on tangible assets, but to the extent possible, define projects holistically and endeavor to incorporate institutional capacity building together with supply and sanitation aspects” (EIB, 2009).

Also, urban sanitation required an integrated handling through its three main pillars: (i) wastewater collection and treatment, (ii) fecal sludge management (compost, biogas, and electricity), and (iii) commercialization.

The World Bank’s The Future of Water in African Cities: Why Waste Water? (2012) aims to change policy makers’ thinking about urban water management, planning, and project design in Africa. It argues that by adopting integrated urban water management (IUWM) approaches, policy-makers in African cities will have a real chance to address such issues as increased competition for water with upstream water users, to improve urban planning by understanding water’s interaction with other sectors, and, in the face of a changing climate, secure resilience in an uncertain future by relying on diverse water sources.
Multi-purpose water projects as a way of using integrated solutions

Multi-purpose projects are those intended to achieve multiple objectives simultaneously. They provide multiple benefits from a single investment. For example, a dam may provide irrigation water, impoundment for hydropower, run-off drainage, and offer flood protection as well as secure flows during droughts, all at once. The multi-purpose use of water acknowledges that water of different quality may suit different purposes—the waste from one use may be the resource for another (a water recycling or integrated management approach). For instance, a water supply project may meet basic human water demands as well as low-scale irrigation through the use of its run-off simultaneously (AfDB 2021 Water Policy).

Use of integrated solutions in rural electrification for better outcomes

The Cluster evaluation on AfDB-funded rural electrification projects\(^\text{11}\) indicated that the integrated approaches optimized the use of electricity as well as its impacts on rural business development and expansion, and standards of living. The rural communities faced multiple barriers to increasing the use of electricity for production. The constraints on promoting demand for electricity from productive units included (i) limited technical and management skills of rural producers, (ii) inadequate access to capital and financing, and (iii) poor quality perception of grid-supplied electricity, which reduced interest in electrical equipment. Accordingly, an effective rural electrification required attendant measures to create economic activities in the electrified localities that will help to make the best of the potential offered by the rural electrification project, for instance, the development of micro-finance services to enable small businesses to procure electrical machines and tools, vocational training services, sensitization campaigns focused on the benefits of electrical appliances with a view to increasing knowledge on the use of electrical machines, making subscription fees affordable to users, etc.

In addition, the evaluations pointed to the need for more synergy between rural electrification and other rural development interventions (Agricultural, commercial and industrial activities involving energy services).

Sustainable Infrastructure Interventions

The impacts of the Bank’s infrastructure investments are context and sector specific. However, there are significant interconnectivities and interdependencies among different infrastructure systems and

sectors at various spatial scales, the RMCs, and other institutions responsible for planning, designing, building, and operating them, and the various communities. To this end, integrated solutions for the Bank’s infrastructure interventions should seek an optimal balance between the social, environmental, and economic dimensions of sustainability, as well as broader development impacts, by considering these interconnections for all phases of the infrastructure development cycle, and to do so as far upstream in the decision-making process as possible.

Lessons on Integrated Solutions in Infrastructure Development

The following are the key lessons from evaluations on integrated solutions in infrastructure interventions:

**Road Interventions**

Lesson 1. Enhancing integrated solutions for infrastructure investments is critical to foster development impact in terms of poverty reduction. Integrated solutions provide an impetus for amplifying the social impacts of infrastructures, which in the long run brings an added value to multidimensional poverty reduction and inclusive development. Thus, first, the Bank should explore more of these integrated projects and proactively adopt them as flagships for its inclusive growth, poverty reduction, and rural development efforts. Second, on the back of its One-Bank approach, it should step up support for community development components of infrastructure projects by deliberately committing more financial resources to them and not treating them as add-ons or afterthoughts. However, the Bank should also be cognizant of the fact that such approaches may not work in all contexts and, hence, should adapt the choice of the ancillary works/services to local realities.

Lesson 2. Adopting an integrated solution in road projects is paramount to reducing costs and amplifying the impact. The ancillary works generated a proportionately more significant additional effect than their additional costs. This is because certain infrastructure systems’ degree of effectiveness, efficiency, and sustainability can directly and indirectly impact others.

Lesson 3: Coupling infrastructure projects with community development interventions is required to increase the likelihood of benefits to women and girls. In particular, the evaluation demonstrated marked gains regarding women’s and girls’ access to social services such as health and education. This form of integrated intervention can add a layer of gender sensitivity to road interventions.

**Water Sector**

Lesson 4: The use of horizontal and vertical integration solutions in the design of water interventions is critical to foster development effectiveness. For instance, balanced investment between water production, distribution, and sanitation is critical in maximizing the impact of UWSS interventions. A case in point is the Mauritania urban water project, where focus on water supply at the expense of attention to the distribution network resulted in a high percentage of leakage (58%). In addition to the water loss, the wastewater infiltrated from septic tanks and the sewage network will find its way into the water supply network through leakage points. In contrast, the benefits of UWSS were more clearly manifested in Morocco and Mauritius, where the governments integrated UWSS with tourism and small- and medium-sized business opportunities within their integrated development strategy and plans. This approach optimized UWSS use, business development, and expansion and helped to raise living standards.

**Energy Sector**

Lesson 5: Including support for the implementation of attendant measures (sensitization, education, vocational training, and establishment of microcredit) is paramount to maximizing the development outcomes of rural electrification projects.

Lesson 6: Integration between rural electrification and other rural development projects (irrigation, agriculture, water supply, health, education, microcredit, etc.) is critical for better outcomes. The productive impact of rural electrification was highest in Tunisia, where the Government integrated electrification in a holistic rural development plan.

**Relational factors critical for sustainable infrastructure interventions**

Lesson 7: Relational factors are key to the sustainability of an infrastructure intervention, as they can amplify or jeopardize its impact. Thus, relevant relational factors need to be incorporated in the design of the intervention, its implementation, and follow up to facilitate sustainability. These include relational factors at the multilateral level, at the national level, at the regional and local levels, and at the community and household level. It also requires that in the process of implementation, “participation processes” are not substituted or reduced to an “informational process.” This is especially important at the local level.
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References


About IDEV

Independent Development Evaluation (IDEV) at the African Development Bank carries out independent evaluations of Bank operations, policies, strategies and processes, working across projects, sectors, themes, regions, and countries. By conducting independent evaluations and proactively sharing best practice, IDEV ensures that the Bank and its stakeholders learn from past experience and plan and deliver development activities to the highest possible standards.

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Publication date: October 2021

This lesson note is available at idev.afdb.org