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AFRICA

Increasing Access to Infrastructure for Africa's Rural Poor

Maximo Torero and Shyamal Chowdhury

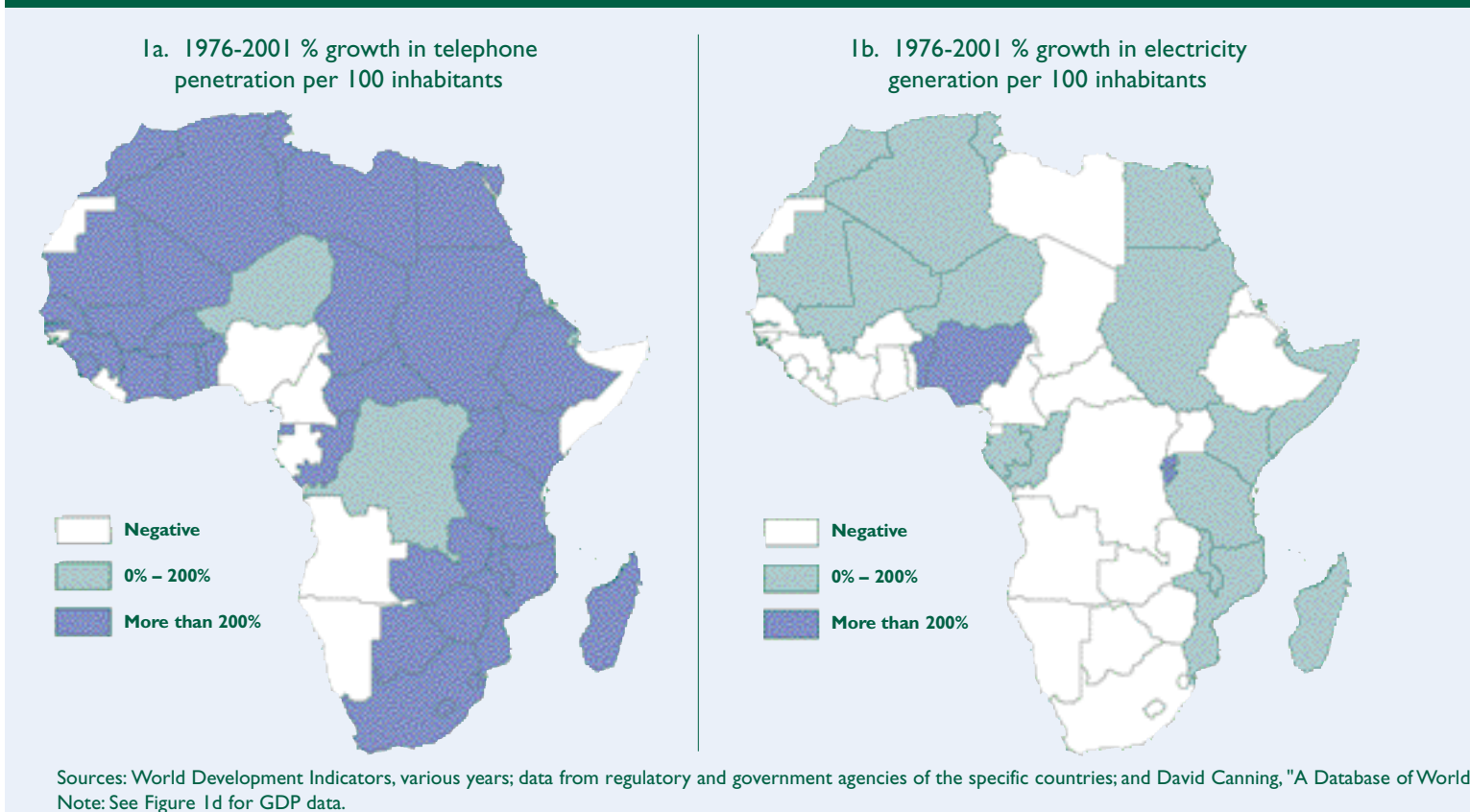
The development community is increasingly in agreement that providing adequate hard infrastructure (i.e., capital-intensive infrastructure such as rural telecommunications, electrification, and rural roads) is an important step in the process of alleviating poverty and providing a more equitable set of opportunities for citizens in developing countries. In infrastructure development, Africa has lagged behind the Western Hemisphere for centuries, even trailing Latin America in recent decades. This has normally been attributed to geography and the initial condition of Africa's infrastructure. Disease, internal distances, and sparse population have been important factors as well.



Unlike Asia or Latin America, Africa inherited a highly dispersed and unevenly distributed infrastructure from its colonial past. During the colonial era, little was done to improve Africa's infrastructure; in fact, according to Jean-Philippe Platteau, "in some important respects, it can even be said that colonial policy reinforced the handicaps of SSA [Sub-Saharan Africa]" (p. 200). The limited infrastructure built during that era was driven by the objective of connecting natural resources to export markets. For example, Platteau notes that "two-thirds of the African railways built in the colonial period connected mines to a coastal harbor" (p. 200). The rest of the continent was virtually ignored; according to Ester Boserup, "only the Union of South Africa with mass immigration of Europeans had more than six meters of railways per square kilometer in 1970, and six countries had no railways at all" (p. 148). In most African countries, especially landlocked ones, the skewed distribution of infrastructure was somehow perpetuated even after independence.

Moreover, in those countries that did see infrastructure improvement, the quality of the infrastructure remained an issue, and as a result incomes did not rise. Despite changes in access to infrastructure, gross domestic product (GDP) per capita remained practically unchanged in Africa between 1976 and 2001 (see Figure 1). This could be a consequence of lack of demand because of sparsely populated areas and a resulting low capacity to maintain infrastructure and to obtain expected returns. In addition, political factors were an important constraint in Africa, resulting in higher risks and less private investment.

FIGURE 1 Gross Domestic Product per Capita and Access to Hard Infrastructure in Africa, 1976 and 2001



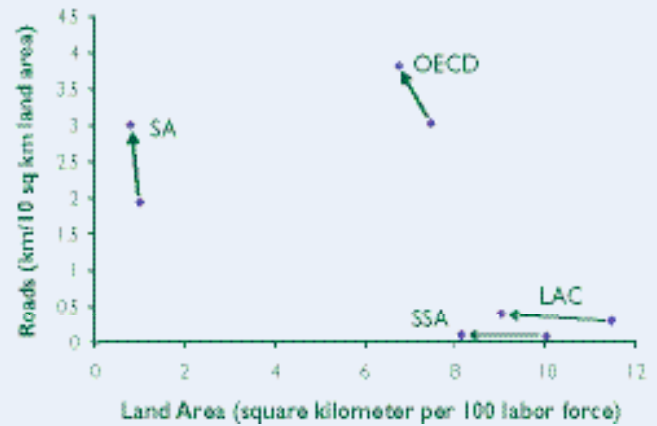
AFRICAN INFRASTRUCTURE INVESTMENT IN RECENT DECADES

Inadequate and unreliable infrastructure services are a fact of life for the majority of rural communities in Africa. Many rural households do not have access to safe drinking water, electricity, good transportation, or modern communication services. For instance, in Burkina Faso, Uganda, and Zambia, walking is the principal means of transportation for 87 percent of rural residents. Ninety-five percent of rural households in Africa depend on traditional fuels, and very few African villages have a single telephone.

Africa's Poor Record of Investment

Figure 2 shows the evolution of this pattern for paved roads. From 1990 to 2000, the land-to-labor ratio for all the country groups shown declined because of population increases, and for most groups paved road density clearly increased, except in Sub-Saharan Africa, where such progress was almost nonexistent. Even the Latin American and Caribbean countries outpaced Sub-Saharan Africa in paved road development. The results are similar for telephone and electricity infrastructure.

FIGURE 2 Paved Roads, 1990–2000



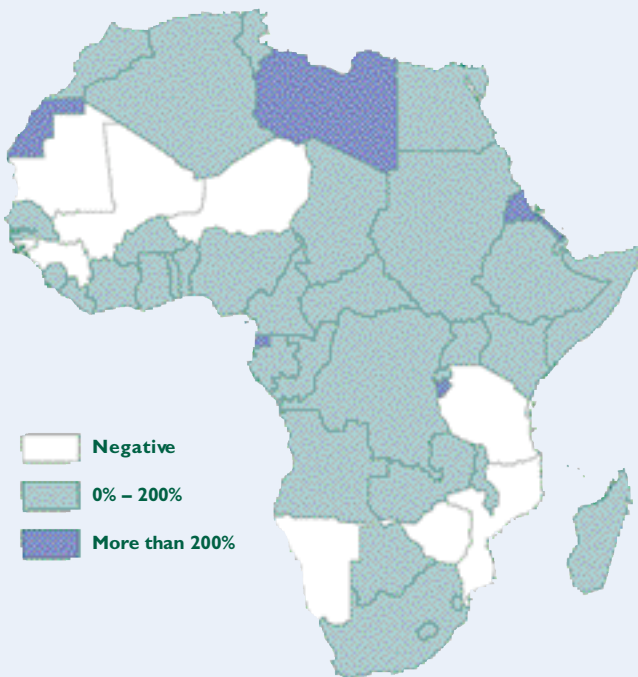
Source: World Bank, *World Development Indicators* 2003.

Note: LAC = Latin America and Caribbean, OECD = high-income OECD countries, SA = South Asia, SSA = Sub-Saharan Africa.

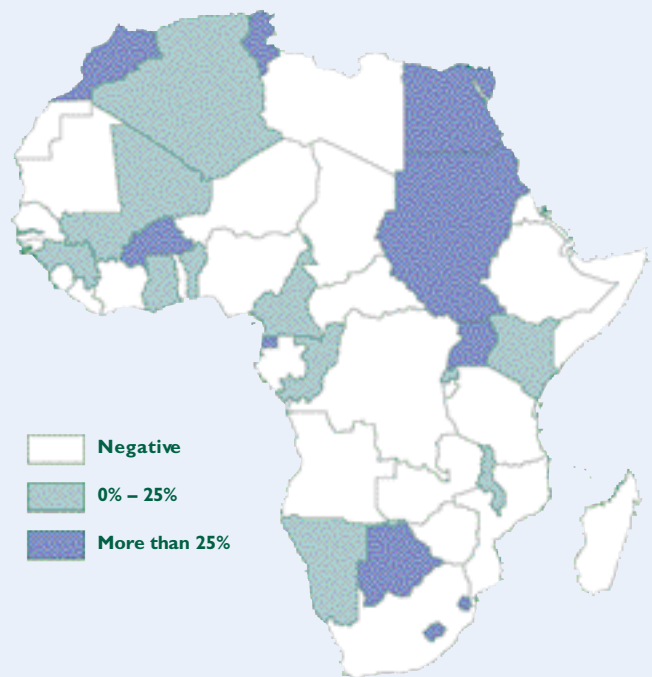
Unequal Access to Infrastructure

Ninety percent of Africa's land and 80 percent of its populated area lie more than 100 kilometers from the coast or from a navigable river. Although rural areas are generally characterized by poor access to infrastructure, it is the poor households within the rural areas that have the least access. Although there might be endogeneity of choice for a location

1c. 1976-2001 % growth in the total road area per country area



1d. 1976-2001 % growth in the GDP per capita



with respect to infrastructure and a household's poverty status, implying that a nonpoor household might afford and therefore select a location with good infrastructure and a poor household might afford and therefore select a location with inferior infrastructure, the availability of infrastructure in the latter location can influence the poor household's status. In fact, evidence shows that access to infrastructure is a significant factor in determining a household's level of poverty.

Predicted Demand for Infrastructure

In a recent study, Fay and Yepes estimated global and regional demand for roads, railroads, telecommunications, electricity, water, and sanitation. According to their estimates, to meet predicted demand the countries of Sub-Saharan Africa will need to invest around US\$25.9 billion annually between 2005 and 2010. Of that annual sum, US\$12.6 billion would be devoted to maintaining existing infrastructure and the rest to building new infrastructure. This will require an annual investment of more than 5.5 percent of GDP. Taking into account Africa's low population density, Wood has predicted it will need to invest at least twice as much of its GDP in infrastructure as will low-income Asia, and will need to meet higher recurrent charges for operation and maintenance as well.

Sector-Specific Development

Development of the different rural infrastructure services in Africa in the 1980s and 1990s was sector specific, with little or no emphasis on cross-sectoral strategies. The common strategy among sectors was to attract private capital and the users' contribution as the principal means of financing. Although the sector-specific strategy worked in some countries and communities, it largely failed to attract the necessary capital to build and maintain rural infrastructure. For instance, some scholars have reported that the policy of leaving the rural transport provision to the private sector was generally unsuccessful in Sub-Saharan Africa. In most cases, transportation markets remained uncompetitive and disproportionately dominated by transportation unions, associations, and formal and informal cartels.

Effects on Trade and Investment

The development of an efficient regional transportation infrastructure has remained elusive in most parts of Africa. This hinders regional and international trade and is a major barrier for landlocked countries. For example, importers in the Central African Republic and Chad pay CIF (cost, insurance, and freight) prices that are 1.3 to 1.8 times the cost of the products when they leave the exporting countries. Similarly, CIF prices for coffee exported from the Central African Republic and Chad are, on arrival in Europe, 2.8 times the production cost.

Poor infrastructure services are partly to blame for disappointing domestic private investment and foreign direct investment in Africa. Although firms can make up for deficient infrastructure services by investing privately, such substitutions impose additional costs. Moreover, some types of infra-

structure services—such as transport infrastructure—cannot be easily substituted. Managers in Uganda rated poor utility services as a major constraint, and unreliable and inadequate electricity supply as the most binding constraint.

Effects on Transportation Costs

Rural households in Sub-Saharan Africa pay much higher transportation costs than do rural households in developing countries in Asia. This is equally true for passenger fares and freight charges. For instance, a comparative study of rural transportation carried out in 1994–95 found that Ghana and Zimbabwe's transportation charges were two to two and a half times more expensive than those in Thailand, Pakistan, and Sri Lanka. Similarly, in the 1986–88 period, long-distance freight transport tariffs in francophone Africa were more than five times higher than tariffs in Pakistan.

ADDRESSING AFRICA'S INFRASTRUCTURE PROBLEMS

Given the apparent failure of pure public infrastructure provision in the 1970s and the failure of market provision in the 1980s and 1990s, it becomes necessary to search for institutional innovations that are appropriate for Sub-Saharan Africa. We suggest focusing on the following activities: evaluating existing institutional frameworks; learning from and replicating the positive impacts of market-led reforms; encouraging public intervention; forging public-private partnerships; and taking into account local demand for services.

Existing Institutional Frameworks

Not all recipes are suitable for all countries, and a potential best practice to a large extent depends on the institutional framework existing in a country. Countries with sound regulatory institutions and legal frameworks can adopt solutions that will be out of reach for countries with weak institutions. However, institutional designs may exist that would be adequate to reduce the access gap while allowing for the simultaneous development of the legal, institutional, and regulatory framework needed to advance different strategies.

Market-Led Reforms

Compared with the provision of electric power and roads, Africa has experienced relative success in the development of telecommunications infrastructure. Two forces have influenced the changes in the telecom sector: technological progress and market reforms. In Africa, the influence of the latter is perhaps stronger than that of the former, resulting in a path of externally driven reform in telecommunications

infrastructure. By 2001, mobile telecommunications penetration had already surpassed fixed-line penetration in many African countries. Although the diffusion had high inter- and intraregional dispersions, most of the countries in Sub-Saharan Africa that opened their mobile telecommunications markets for competition had experienced sizable growth. By 2001, 45 African countries had licensed private cellular operators, and effective competition was emerging in many countries. About 44 percent of the African markets had a duopoly structure, and 30 percent had an oligopoly structure.

Public Intervention

Although countries (such as South Africa, Côte d'Ivoire, Nigeria, Tanzania, and Zimbabwe) that have advanced the most in market-oriented reforms in each sector under study have made progress in closing both the urban and rural access gap, reforms alone are not enough to provide complete infrastructure access in remote poor rural areas. Some sort of public intervention is needed to close this gap. Where the government believes that services should be provided beyond what a well-functioning market will offer, subsidies may be justified to promote additional investment to achieve these governmental goals. But the government should also seek to improve the functioning of the market so that subsidies can provide a maximum benefit when and where they are needed. In particular, a failure to address the impediments to the efficient working of the market in rural areas through regulatory reforms will reduce the availability and effectiveness of resources to address the real access gap in those areas.

Public-Private Partnerships

Infrastructure initiatives that have proven successful usually rely on market mechanisms and the forging of public-private partnerships. Unilateral public or private initiatives have less of a chance of succeeding. Public intervention alone usually is not cost effective, and isolated private initiatives fail to deliver all services. Despite the rise in private-sector involvement in infrastructure provision, the overall investment levels, particularly in rural areas in Sub-Saharan Africa, are far from adequate and much lower in comparison with those in Asia and Latin America. The need for the public sector to play a facilitating role has not been met. Since there is little evidence that rural infrastructure is commercially viable on a stand-alone basis, the role of the public sector needs to be reinvented. To succeed, the public-private mechanism requires that a regulatory office is in place and that some reforms have already taken place—for example, to allow for interconnection with an incumbent operator. This could pose a significant constraint to implementing this solution in countries that lack the required legal and institutional framework.

A Demand-Driven Infrastructure System

An infrastructure system responsive to the demands of people living in rural and remote areas is a prerequisite for social

and economic development in Africa. At present, the estimation of rural infrastructure investment is generally based on the needs assessed for each sector at the national level, with little or no assessment of demand and coordination at the local level, where the services will ultimately be provided. More often than not, such investment assessments do not reflect the preferences of users of services and the contingencies of services.

For instance, demand for secondary schooling may be contingent on access roads, and failing to coordinate these two may result in a mismatch between availability of a service and its actual use. Communities need to choose the technology they want to use and the service level they require and to have a clear understanding of long-term costs and maintenance implications so they can choose what is most appropriate for them under their budget constraints. In this respect, evidence exists that if communities are provided with appropriate information and technical support, they can make informed choices about service options as well as clearly identify their willingness to pay, thereby assuming ownership and responsibility for the infrastructure.

The participation of all institutions involved (private operators, consumers, central government, and regional governments) is essential not only to better assign and supervise the projects but also to identify clearly the needs and demands of the rural areas.

CONCLUSIONS

There is a growing consensus that providing adequate infrastructure is an important step toward alleviating poverty and providing a more equitable set of opportunities for rural citizens by linking smallholders to markets and reducing the market risk and transaction costs they face.

Infrastructure is key to the “production function” of the



Millennium Development Goals (MDGs). But achieving many of the goals, from the eradication of poverty and hunger to environmental sustainability, may depend on infrastructure. For instance, in Sub-Saharan Africa, where less than half the population has access to safe drinking water, child mortality may depend on the availability of clean water. Attainment of universal primary education for girls may also be crucially dependent on access to piped water, facilitating school attendance for girls. In the absence of infrastructure in rural and remote areas, achieving the MDGs will be extremely difficult.

Africa is a special case: it is characterized by adverse geography and low population density relative to other developing regions. Migration, although restricted by the presence of countries that inhibit people's movement, could help to increase coastal populations but at the same time could result in more inequality for landlocked countries.

Nonetheless, with limited public resources, several countries in Africa are undertaking important reform processes to promote private investment in the provision of infrastructure. Moreover, technological innovations that have significantly reduced travel and communications costs offer a new alternative by speeding up the international diffusion of technology, enabling today's developing countries to grow far faster than would have been possible for currently developed countries during the nineteenth century. Many of these new opportunities apply to Africa, allowing for more diversified livelihoods. In addition, increased access to infrastructure reduces the need for populations to concentrate along the coasts.

Market-oriented reforms alone are not enough to provide complete access to infrastructure in remote, poor rural areas. Public intervention is needed to close this gap. There is no unique universal recipe, and best practices are a function of the degree of institutional development in each country. Strategies appropriate in one country may not work in other countries that lack the necessary legal framework and institutions. Moreover, the advantages and poten-

tial of a strategy depend mightily on the institutional environment wherein it will operate.

Finally, infrastructure in Africa is not only a country problem but also a regional one, and therefore an integrated regional approach is needed. For example, improvement of roads and ports in Tanzania can help landlocked countries such as Uganda and Malawi transit their trade more efficiently. Therefore, Uganda and Malawi have a direct stake in road and port improvements in Tanzania, and thus reforms need to be addressed regionally.

In addition, a lack of coordination characterizes the country, regional, and donor levels, where the linkages and complementarities of infrastructure investment have not been realized. The fragmented approach that results, lacking sufficient attention to substantive policies and development issues, does not help countries achieve their MDGs. In fact, in many cases, access to infrastructure has not been linked to poverty-alleviation strategies or to the general development goals of countries. Therefore, it behooves policymakers, interested agencies, and other actors to take an integrated approach even if the actual design may vary from country to country, because one size may not fit all.

For further reading: E. Boserup, *Population and Technology* (Oxford: Blackwell, 1981); M. Fay and T. Yepes, *Investing in Infrastructure: What is Needed from 2000 to 2010? Policy Research Working Paper 3102* (Washington, D.C.: World Bank, 2003); F.A. Gebreab, *Getting Connected: Competition and Diffusion in African Mobile Telecommunications Markets*, Policy Research Working Paper 2863 (Washington, D.C.: World Bank, 2002); J.-P. Platteau, "Physical Infrastructure as a Constraint on Agricultural Growth: The Case of Sub-Saharan Africa," *Oxford Development Studies* 24 (No. 3, 1996): 189–219; R. Reinikka and J. Svensson, *How Inadequate Provision of Public Infrastructure and Services Affects Private Investment*, Working Paper 2262 (Washington, D.C.: World Bank, 1999); A. Wood, "Could Africa Be Like America?" Department for International Development (DFID), London, 2002, mimeo.

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