Rural Infrastructure in Africa: Policy Directions

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Abstract

The World Bank is updating its global rural development strategy From Vision to Action. This paper focuses on rural infrastructure strategy (RI) and comprises four sectors: i) Rural Transport; ii) Rural Water Supply and Sanitation; iii) Rural Energy; and iv) Rural Telecommunication and Information.

The first section of the paper presents rural infrastructure within the development context of Africa. The second section reviews experience gained about the role of rural infrastructure in the African rural transformation process. It also includes an overview of each sector’s characteristics and emerging strategies. The third section synthesizes five common operational themes. The final section presents actions and targets for achieving sectoral goals.

The paper concludes that the overall rural infrastructure vision in Africa should be the provision of affordable and sustained rural infrastructure services that contribute to rural transformation. The vision is based upon an integrated approach that puts community and local governments at the forefront without neglecting the policy and institutional reforms required by the various sectors.

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This paper is the product of a participatory process among World Bank practitioners in the Africa Rural Infrastructure sector. The process involved several group and individual discussion sessions with a range of Bank staff, as well as an exchange of comments on three draft versions circulated to a core set of contributors. The task team leaders were Jennifer Sara and Imogene Jensen.

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1. Background and Objective

The World Bank is updating its global rural development strategy From Vision to Action. In connection with this, the Africa Region has created a multi-sectoral steering committee to identify a number of building blocks and gaps in available information. These include: (i) facts, analyses, trends on rural growth and poverty reduction; (ii) trends and analysis of agricultural and non-agricultural rural Bank lending and sector work; (iii) infrastructure strategy (including roads/transport, water/sanitation, energy/electrification, telecom/communications); (iv) human development (including education, health, social protection); (v) vulnerability and strategies to mitigate risk; (vi) private sector development (including agri-business); (vii) rural finance; agricultural growth/poverty reduction linkages; and (viii) natural resources management.

This paper focuses on the third building block: rural infrastructure strategy and includes four sectors:

i) Rural Transport

ii) Rural Water Supply and Sanitation

iii) Rural Energy

iv) Rural Telecommunication and Information.

It should be noted that a number of cross-cutting thematic areas critical to rural infrastructure (RI) service delivery, notably, decentralization, local government and finance options, are dealt with in respect of each sector. In the case of private sector rural finance options, a separate building block paper has been prepared.

The paper is divided in four sections. The first section presents rural infrastructure within the development context of Africa. The second section reviews knowledge gained from experience about the role of rural infrastructure in the African rural transformation process. It also includes an overview of each sector’s characteristics and emerging strategies. The third section synthesizes five common operational themes. The final section presents actions and targets for achieving the sectoral goals.

2. Development Perspective

The lack of adequate, affordable and reliable infrastructure services touches the life of a rural African family every day. Starting in the pre-dawn hours, many women must walk long distances to the nearest water supply, which may be neither safe nor adequate for their needs. They cook with inefficient technologies, utilizing wood that is cut farther and farther from the village. At the same time, they are subjected to fumes that can damage their lungs and eyes.

Family efforts to rise above subsistence are limited by poor access to markets, supplies and vital information. Local roads are impassable, and there is no telephone or other communication facilities for many miles. The potential for agricultural processing, small business development
and rural employment is constrained by the lack of electricity. Even if a health clinic exists, the lack of electricity prevents the clinic from stocking refrigerated medicines. In the evening, children who go to school must read and do their homework by dim lighting provided through expensive and often polluting sources.

While the above description is anecdotal, variations of this scene are familiar to all who have seen or lived in rural Africa. A glimpse of the problem may be seen by the following statistics:

i) Recent studies in Burkina Faso, Uganda, and Zambia show that walking is the principal means of transport for 87 percent of the rural households; in most Sub-Saharan countries women account for about 65 percent of the time spent in movement for household and agriculturally-related chores (Barwell, p.2).

ii) Less than half the people in Sub-Saharan Africa have access to safe drinking water (World Bank Poverty Net Indicators – Water Supply).

iii) Over two-thirds of the continent’s population lack adequate sanitation services (World Bank, WSS).

iv) Only about 5 percent of Africa’s rural residents have access to modern electricity, while over 95 percent are dependent on traditional fuels, mainly wood or cow dung for cooking, heat and light (Sanghvi, p.3).

v) Telephone lines serve primarily urban areas in Africa; very few African villages have a single telephone. The average disparity of “teledensity” (number of lines per person) between urban and rural areas in Africa is estimated to be as high as 25:1 (Dymond, et. al. p. 4).1

3. Lessons Learned and Sector Strategies

Rural infrastructure services play a critical role in poverty reduction, economic growth and empowerment for the African rural poor. Experience has shown, however, that it is not enough to simply meet demand for services by constructing a road, installing a water pump, or planting trees for fuel wood. This has been easily accomplished in the short run by building infrastructure with donor funds and local contributions. More often than not, the quality and level of these services steadily diminishes. As a result, practitioners are now posing the question: how can countries and rural communities not only provide physical infrastructure, but also ensure that services are continuously provided on a sustainable basis at appropriate levels of quality and affordability?

A. The role of rural infrastructure sector strategies in rural transformation

1 More recent estimates indicate that 25:1 is an average for Africa, and that urban-rural disparities can go as high as 60:1.
Rural infrastructure can be seen as the complex of physical structures or networks within which social and economic activities are carried out. These structures are not ends in themselves, but are means to achieving the broader goals of poverty reduction and economic growth. Rural infrastructure contributes to these goals by providing essential services such as water and sanitation; energy for cooking, heat and light and employment generating commercial activities; transportation of goods and people; and the transmission and communication of knowledge and information.

Rural infrastructure is one of numerous subsets of activities that comprise the essential elements of African rural transformation. These include local governance, health and educational services, agriculture and other economic activities. All these endeavors occur in a dynamic environment, in which various economic actors—individuals, communities, enterprises and local and national governments—play discrete, complementary and sometimes overlapping roles.

The impact of this process depends upon the extent to which these actors interact effectively with each other. Without an adequate policy environment, they can be stymied by excessive government management and lack of incentives for achieving cost-effective and durable service delivery. Moreover, if adequate sector-level policies and institutions are not in place, then investments in infrastructure may provide only transitory benefits. Therefore, sector-level policy dialogue and institutional reform must remain high on the Bank’s agenda not only to provide a short term response to demand, but also to achieve realistic quality, affordable and sustained rural infrastructure services in the longer term.

Service delivery results from decisions made at various levels by the above-mentioned economic actors. These decision-making levels—unique to each sector—need to be fully understood in order to: (i) provide policy and incentive frameworks, and (ii) maintain a balance between decisions that are considered within the competence of the individuals, communities, enterprises, and governments.

For example, in the energy and telecommunications sectors, the decision to invest resides with the private sector and local communities, while governments seek to attract investment and provide incentives for equitable provision. By contrast, in the transport sector, the decision to improve rural roads is made by public entities at various levels. Rural water supply and sanitation decisions are generally made at the community or individual level. Table 1 summarizes some distinguishing features of the four types of rural infrastructure in terms of physical characteristics, ownership, decision-making, and finance.

In Africa, rural infrastructure service delivery models have entered a period of transition, moving away from centrally-controlled public sector provision to more demand-driven and decentralized delivery models. The following sections will demonstrate how sector-specific African rural infrastructure delivery models are now at a crucial point of formulation and testing, and need further nurturing.

These models have occasionally been overshadowed by the recent drive toward community-driven development (CDD) and the focus on meeting immediate service demands through non-earmarked social development funds (SDFs). While these programs have proven successful in
empowering communities, they have at times failed to adequately address the sector-specific policy and institutional issues necessary for assuring continued delivery over the medium and long term. As a result, the programs may be supporting approaches that could undermine policy reforms aimed at long term quality and sustainability. A major challenge, therefore, is how to develop community-driven programs that do not bypass—but support—institutional requirements particularly at the national and local government levels.
Table 1: Characteristics of Rural Infrastructure Sectors

<table>
<thead>
<tr>
<th>Development Perspective</th>
<th>Physical Characteristics</th>
<th>Ownership and Decision-Making</th>
<th>Finance Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Transport</td>
<td>Roads, tracks, paths, footbridges (rural transport infrastructure), providing access to daily activities and linking villages to each other and to the main road network. Two levels of subnetworks: (i) local government roads; and (ii) community roads, tracks, paths and footbridges.</td>
<td>Ownership is with either the local governments or communities. While central agencies might provide technical support, management responsibility rests with the local bodies.</td>
<td>Investments are usually financed by donors, requiring local contributions. Maintenance finance is predominantly a local responsibility. Road Fund resources based on fuel levies, tolls and other user fees are often tapped to finance major maintenance.</td>
</tr>
<tr>
<td>Rural Water and Sanitation</td>
<td>Wells, boreholes, spring sources, piped network systems, and latrines. Systems serve individual households, villages or towns, and do not extend beyond community service area (except for multi-village schemes and network extensions for urban centers).</td>
<td>Decision to invest resides with community or local government. Systems are community assets and managed by user groups at the community level.</td>
<td>Capital costs generally financed through donor funds or inter-governmental transfers, with a clear up-front contribution by the community. All O&amp;M costs are covered by user tariffs.</td>
</tr>
<tr>
<td>Rural Energy</td>
<td>Traditional fuels (mainly wood, charcoal and cow dung) are typically 90-95 percent; electricity is typically 5-10 percent, and hydrocarbons (mainly kerosene and liquefied petroleum gas) are typically 3-5 percent. Electricity service is provided through national networks and increasingly, decentralized local networks, largely based on renewable energy. Traditional and hydrocarbons fuel use generally through suppliers or supply chains.</td>
<td>Traditional fuels generally through private trade; large electricity grids currently still dominated by state monopolies or concessions; trend toward private/public partnership financed investment in &quot;mini-grids&quot; and PV solar sources.</td>
<td>For electrical systems: All replacement investment, O&amp;M costs should be tariff funded. System extension to be mainly privately and commercially funded, provided risk profile is made acceptable (largely through bank group instruments). Private/public partnership and smart subsidies involving one-time support to access costs as incentives for innovative solutions and extending service to needy areas. Potential future financing and technology transfer through Global Environment Facility (GEF) and Clean Development Mechanism (CDM).</td>
</tr>
<tr>
<td>Rural Telecom and Information</td>
<td>Traditionally, wire, microwave, cable and fiber networks, with a rapidly overtaking complex of wireless, radio, cellular and satellite technologies and connectivity through the internet.</td>
<td>Investment and services supplied through private sector; some potential for community-based telecenters.</td>
<td>Commercial model with all investment, O&amp;M costs reflected in the tariff; smart subsidies involving one-time support to investment costs provide incentives for innovative solutions and extending service to needy areas.</td>
</tr>
</tbody>
</table>
B. Rural Transport

**Characteristics**

Rural transport infrastructure includes the rural road, track and path network on which the rural population travels by means of walking and on non-motorized and motorized vehicles. This network includes the intra- and near-village network of tracks and paths, as well as the local government network, which links the rural population to the rest of the economy and the outside world (Lebo and Schelling, p. 4).

The ownership and effective responsibility for managing and maintaining the rural road network is not always clearly defined. Within the context of decentralization programs, there is a clear trend to assign responsibility for rural road management to local governments and decentralized entities, such as prefectures, districts and *communautés rurales*. Numerous variations exist on the definition of “local government,” particularly between anglophone and francophone countries. Within those networks, responsibility may be further assigned to, or *de facto* assumed by local groups or villages. A formalized and clearly-defined road classification system is the first and most fundamental step in effective and sustained management of the rural road network (Malmberg Calvo, p. 15).

Decentralized entities and local governments rarely have the expertise or the financial resources to independently manage and maintain their road networks. Subsidies usually come from inter-governmental transfers, social development funds or other donor-supported projects, which are used to leverage local contributions in cash or kind. Technical and management support sometimes come from line ministries, but are often supplied through donor projects and NGOs. The cost of construction, major rehabilitation or major periodic maintenance have been generally financed through donor resources, while routine maintenance is expected to by financed out of local resources.

**Lessons Learned**

In the past, rural transport projects focused primarily on achievement of physical outputs, and selection of projects was based on economic rates of return. There was limited participation by the users, and maintenance systems were based on periodic rehabilitation or replacement of degraded roads, rather than preventative maintenance to extend a road’s useful life. The application of economic rates of return to select road investments led to a bias in favor of roads with higher traffic levels and promoted over-design and higher costs than necessary. The selection of individual roads based solely on economic criterion also led to the improvement of “stranded” sections of the network, lacking further links to the wider network. The result has been highly inefficient utilization of public funds, non-transparent selection, and many people still without basic access.

**Strategy**
The above experience has brought about a shift in Bank lending towards a more demand-driven, network-oriented and service-level approach to rural transport. This strategy is characterized by five essential elements:

i) a **national policy framework**, which classifies the road network and assigns responsibilities for management at various levels; provides the policy and regulatory framework for investment and sustainable road maintenance financing; and sets the regulatory framework for promotion of private sector supplied transport services, including non-motorized, intermediate forms of transport (Malmberg Calvo, p. 16).

ii) a **network management approach**, which enables the decentralized entity or local government to visualize its rural road network and assess its condition through simple yet systematic road inventories and assessment procedures (Malmberg Calvo, p. 20).

iii) a **logistics and service level planning and management approach**, in which a community analyzes its access problems in a multi-sectoral context, and road conditions are assessed in terms of their provision of various levels of access (for example, simple all-season passability or ability to travel at average speeds of 20 to 50 km/hour). This enables the decentralized entity to make informed choices on priorities for achieving equitable all-season access of its constituents and examine trade-offs with other public service investments (Lebo and Schelling, p. 6-10).

iv) a **service-level technical approach**, which is oriented towards achieving the minimum service levels required to obtain the basic access levels chosen above. For example, spot improvements to critical points or even small footbridges may be all that is required to ensure all-season passability within a community that has limited traffic levels. As economic activity grows, certain links with higher effective demand may be scaled up to fully engineered single-lane roads (Lebo and Schelling, p. 11). This enables the decentralized entity to make the most efficient use of public funds utilizing objective and transparent criteria, and scale up investment levels as the demand for higher service levels grows.

v) the **promotion of gender-sensitive rural transport services**, particularly intermediate forms of transport, which will assist the rural poor, and women in particular, to resolve their access problems. This approach can have a bearing on the types of network improvements chosen.

This strategy involves a change in the way we view transport infrastructure, from a view focused on the “hardware” of roads, to one focused on the “service” that the road provides and finding cost-effective ways to provide that service. The strategy is more holistic in that it takes effective demand for transport services into consideration for the technical design of the network improvement and investment options are viewed within a multi-sectoral context.

Ultimately, the strategy is minimizing the distinction between road rehabilitation and road maintenance activities. Once the overall road network is “stabilized” through the achievement of a minimum level of service, the decentralized entity turns its attention toward managing and
maintaining the system at the desired level of service. This new vision is being expressed in pilot projects focusing on road management and maintenance contract concessions.

C. Rural Water Supply and Sanitation

Characteristics

Rural water supply and sanitation (RWSS) infrastructure includes a broad range of facilities that serve residents in villages and rural towns. Facilities include protected communal hand-dug wells with or without a water lifting device; communal boreholes equipped with hand or mechanized pumps; piped water supply systems with filtration, storage and distribution networks with standpipes or house connections; protected spring sources with or without distribution networks or storage; rainwater catchments; and household privately managed public latrines, as well as school latrines. In contrast to road infrastructure, these systems are generally restricted to individual villages or rural towns, although they are sometimes part of an multi-village network.

With the exception of household latrines, RWSS infrastructure is considered community or local government-owned. However, the ownership of the assets is rarely legally established. In many African countries, a central ministry or autonomous agency is responsible for assuring RWSS throughout the country, who usually makes the investment decisions on the basis of perceived needs. This supply-driven approach does not take into account that improved water supply services have a cost that needs to be met by the users to be sustainable. It is therefore the users who should decide if they are willing to pay the cost of an improved level of service, versus the existing alternative of unimproved service, which also has an associated economic cost in terms of time and health.

The capital cost for RWSS infrastructure is generally subsidized through intergovernmental transfers, social development funds and donor projects, with most programs requiring a certain level of cash or in kind contribution by the beneficiary communities. The communities are generally expected to organize themselves into some sort of water user organization and fully recover the cost of operations and maintenance through tariffs or user fees. An increasing number of RWSS projects are being funded through Bank social development funds and other multi-sectoral projects.

Lessons learned

Decades of experience has driven the sector away from a traditional supply-dominated philosophy to a more demand-responsive approach to service delivery. The traditional approach, still found in many African countries, is based on the perception that because the need for water and sanitation is self-evident, national water supply agencies should achieve universal coverage by offering standard systems to communities throughout the country. The communities would then “queue” for “their” systems, and be selected based on needs and equity criteria. With this basically top-down approach, communities have little or no say in the choice of technology or service-level, and have limited understanding of long term cost and maintenance implications. While the traditional approach has in some cases achieved physical coverage targets, it has led to a heavy reliance on central technical agencies, who themselves have limited capabilities. Even
after receiving initial training, community organizations are for the most part weak and systems are plagued by breakdowns and not maintained on a sustainable basis (Garn, p. 7).

Strategy

A revised strategy has emerged, which starts with the assumption that a rural community can—if provided with appropriate information and technical support—make informed choices about RWSS service options. Armed with this information, communities will express their willingness to pay for a chosen service level, and in so doing, will more fully take ownership and responsibility for long term operations and maintenance (Garn, p. 7). This approach is embodied in a Regional Strategy for Water and Sanitation for Sub Saharan Africa, wherein “a focus on universal access has replaced pre-occupations with universal coverage; innovative demand-driven approaches, with incentives for the operators to improve services, contrast with previous policies of supply-driven government service provision...." This strategy can be characterized by the following guiding principles:

i) **a favorable national policy environment**, wherein the national technical agency shifts its role from one of direct provider of RWSS, to one of facilitator and regulator, while the local communities become the clear owners and managers of the RWSS assets. Related aspects of the necessary policy environment involve the establishment of the legal conditions for full community ownership of assets; the development of an enabling environment for private sector technical and management support services to communities; and the formulation and assurance of quality norms for service-level, technology and finance options available to the communities.

ii) **financing options based on demand and service level choices**, in which communities “self-select” for subsidization of capital costs through up-front cash commitments; explore various public and private sector options for finance; achieve an appropriate balance between service-level investment and operations and maintenance cost; and develop appropriate tariff policies adapted to the needs of individual systems.

iii) **selecting from a range of technical and institutional service delivery options**, in which communities and local governments are assisted, through social intermediation, to make an informed choice on an affordable level of service; to organize themselves into effective water user associations; and to seek out private and public-supported management options for assuring the desired levels of service.

iv) **integration of hygiene and sanitation issues**, which includes water, sanitation and hygiene education, so as to promote behavioral changes that will ensure achievement of health benefits of the investment and generate demand for quality service levels to achieve those health benefits.

v) **integration of gender and poverty issues**, which recognizes women as the primary users of water and within which equity participation is consciously achieved through transparent processes and information flow and exchange; rules are set to target poor,
unserved areas and vulnerable groups; and affordable systems are developed to respond to the demands of the poor.

vi) *a strong capacity building element*, which involves assistance not only to local governments and communities, but to the reformulated national support agency and the complex of private sector and NGO support organizations for planning; equipment supply, installation, and spare parts; and operations and maintenance.

vii) *inclusion of environmental management issues*, which involves systematic mitigation of potential impacts, such as water-related diseases, pollution and waste disposal, and long-term protection of water and related resources; and the incorporation of integrated water resource management principles into project.

This strategy involves a fresh perspective on the concept of water as an essential commodity that has value. Viewed in this way, the provision of RWSS services necessarily becomes a demand-driven process. Local governments and communities are more apt to take ownership and think more critically about how to assure the services in the longer term, without dependence on the national agency. Initial results in Africa and elsewhere have been promising, and have changed the way local communities are looking at service provision in other sectors.

D. Rural Energy

*Characteristics*

Rural energy is supplied through three essential means, each with its own source, distribution, product and delivery chain characteristics: electricity (5-10 percent); modern liquid/gaseous fuels, principally kerosene, liquefied petroleum gas (LPG) or diesel (3-5 percent); and traditional fuels, consisting of biomass—wood, charcoal, straw and cow dung (90-95 percent). In Africa the application of these energy sources can be organized in an “energy ladder” as follows (Foley, Floor et all).

i) *Traditional energy* applications (cooking and heating) for household and traditional rural industry utilizing biomass fuels.

ii) *Secondary traditional energy* for household applications (cooking and heating) based on biomass such as charcoal or methanol based fuels.

iii) *Transition modern energy* applications for households (cooking, heating, lighting) and small rural enterprises, and rural communal services characterized by the increased utilization of modern liquid/gaseous fuels both *thermal applications, lighting and motive power applications*.

iv) *Decentralized off-grid electricity* for lighting, thermal and motive power applications, as well as a host of other uses which rely exclusively on electricity such as telecommunications (electric batteries, mini-grids, solar PV and other renewable based electricity).
Presently, electricity grid service is still dominated by state-owned monopolies or concessions, but prospects are for an increasing involvement of the private sector and for commercial financing, provided the investment risk profile is adjusted to international standards. Possibilities are growing for promoting private/public partnership financing and operation of decentralized energy infrastructure: mini-grid or independent electricity systems, powered either by mini-hydro, wind, sugar bagasse, conventional diesel; or PV solar when grids are not feasible. In the traditional energy and transition to modern energy applications, management and ownership are private, but public sector investment support is needed to finance access cost with end-users.

Improved access to transition to modern energy or electricity is strongly linked to education and health in two ways: (i) directly by providing access to lighting to students and reducing health hazard in rural households; and (ii) indirectly through allowing hospitals, AIDS/HIV programs and schools to operate more efficiently. Through these linkages, improved access to better quality energy has a significant gender related impact. Upgrading access to and quality of energy has been demonstrated to contribute substantially to job creation in rural small and medium-size enterprises.

**Lessons learned**

Since the 1970s, projects for traditional rural energy have addressed the need for sustainable supply management of wood fuel energy sources, as well as demand management through more efficient combustion technologies and substitution by cleaner and alternative renewable sources. Early efforts were guided by a perception that the loss of woodlands in Africa was largely due to unsustainable wood fuel harvesting. The response was to vigorously promote additional tree-planting and exercise command and control-type regulation of wood cutting and marketing to urban areas. In fact, there is now increasing evidence that the conversion to higher value agricultural uses has been the main culprit in forest resource loss, and that woodlands will generally thrive under multiple use management when put under prudent stewardship by local people who have effective ownership (Foley). Hence, a new generation of wood fuel supply programs is focused on devolving ownership and control of local wood fuel resources, and reducing the “command and control” approach of traditional forest management agencies. These enlightened approaches are being accompanied by a broadened perspective that involves a mix of more efficient wood fuel combustion technologies and cleaner cooking fuels.

Studies have shown that rural households and especially rural enterprises, would be willing to pay for rural electrification, if only reasonably reliable and affordable services were available. At the same time, national monopoly utilities, financially crippled by below-cost universal tariffs, are unable to expand service to meet demand. Thus, despite a growing demand, the supply response capability is lacking. This is due largely to a policy environment and financial institutional structure that is not conducive to private investment in decentralized rural settings.
Other factors are the high risk to private investors, lack of knowledge of alternatives to large grid electrification, and lack of contact with potential energy markets in the rural areas.

The universal tariff monopoly electric utility model has largely failed to achieve significant rural electrification coverage, due to high costs, undue political interference, misdirected tariff policies and an urban-centric management approach. The approach has relied heavily on high cost grid extensions as the primary delivery mechanism for expanding outside urban areas (Sanghvi). There is now a consensus that the future for rural electrification lies with commercially-based services that would involve an expanding range of options for rural supply. This includes concessions to extend from main grids, introduction of independent mini-grid systems powered by renewable sources, and PV solar systems where independent grids are not viable.

Bank programs that promote the transition to rural electrification services must therefore balance the need for private sector solutions for cost recovery with risk-taking incentives for investors. The programs need to ensure a national regulatory climate conducive to private investment, as well as provide incentives for cost-based differential tariffs and one time "smart subsidies" that will ensure service to the otherwise underserved areas, while enabling the poor access to affordable service.

Finally, the commercial orientation for rural energy development has led to a more explicit focus on the potential market and demand for rural energy. This coincides with a broader view of improved energy services as an integral part of the rural transformation process. It has opened up new potentials for cross-sectoral collaboration and synergies. Examples include the parallel introduction of telecommunications and rural electrification, as well as determining in what ways improved energy services can increase the quality of water supply, health, and education services.

**Strategy**

Bank energy programs are now pursuing a "paradigm shift" in conjunction with client governments. This new strategy involves three major themes: (i) combining rural energy programs with household, economic and social activities that enable consumers to express demand for various service levels; (ii) devolution of ownership and providing market power to rural residents to sustainably manage wood fuel energy sources; and (iii) a more commercial, decentralized and demand-driven approach to rural electrification, with a focus on achieving rural transformation.

This strategy has emerged in the favorable context of increasing decentralization and community-driven development programs. The strategy can be characterized by the following guiding principles:

i)  *Stretch project boundaries to focus on rural transformation*, through cross-sectoral linkages with demand-generating activities. This will help to focus on identifying and responding to energy needs not only for households, but for a wide range of enterprises and public services. These would include for example, the promotion of telecommunications, computers, internet and information services; coordination with...
water supply, health clinics, AIDS/HIV programs, schools and marketplaces; and coordination with income producing endeavors such as cottage industries, agro-processing, etc.

ii) *initiate energy policy reforms*, wherein the government adopts the role of market enabler for both rural electrification and sustainable, market-based solutions to traditional and renewable energy sources. This includes the establishment of a legal and regulatory environment that will encourage new entrants into the electrification market and channel investment to them. The environment will also devolve forest and woodland ownership and management responsibilities and institute economic incentives that will promote sustainable use and exploitation of traditional and renewable energy resources at the national level, as well as empower local communities to engage in market-based solutions for managing their biomass energy resources.

iii) *achieve full cost recovery and “smart subsidies” for capital financing of rural electrification*, in which sustainable service provision is ensured through differentiated, or bulk tariff structures that cover investment, operations and maintenance costs, while ensuring affordable service to consumers with varying capabilities to pay. This approach is supported with Rural Electrification Funds, which subsidize capital costs for service to targeted regions or consumers in conformance with strict cost-recovery criteria.

iv) *promote low-cost technologies and untapped potential for renewable energy resources*, through which seed funds are mobilized to develop, market-test and finance low-cost and innovative approaches to local and small mini-grid alternatives using renewable energy sources, such as mini-hydro, solar PV, and ethanol production.

v) *encourage innovative and pilot institutional partnerships*, which include public-private arrangements for ensuring minimum service levels to needy populations at affordable tariffs; leveraging GEF and other donor funds to promote innovative solutions in renewable energy sources; and exploring the global emissions trading market for attracting foreign technology transfer and funding through the Clean Development Mechanism.

The ultimate goal of the revised strategy is to gradually make the transition from traditional sources to modern liquid/gases and renewable and “clean” rural electrification. This will occur as effective demand is expressed, and the supply response mechanisms become operational. In the immediate future, the strategy must continue to vigorously pursue both traditional and decentralized rural electrification schemes. The pace of transition will vary from country to country.

**E. Rural Telecommunications and Information Services**

*Characteristics*

Telecommunications and information services are delivered through rapidly evolving and emerging technologies. Information is transmitted over networks based on normal wire,
microwave, cable or fiber technologies, as well as over a growing complex of technological options utilizing wireless, multi-access radio, cellular, and satellite means. These telecommunication services also provide the infrastructure necessary to access a broad range of additional information services, such as the internet and those supporting tele-learning, education, health, and other public services.

The most striking trend in this fast-moving arena is the explosion of wireless services based on cellular, personal communications and “wireless local loop” systems. Worldwide wireless subscribers are increasing at rates of 30 percent to 50 percent per year (Dymond, et.al. p. 17), while in Africa the latest figures put this growth rate at 150 percent per year. This explosion is a direct result of market liberalization of this sector. Unleashing competitive forces has reduced prices and is broadening the potential for access in rural areas.

Historically, telecommunication services have been provided by monopoly agencies or state-owned enterprises. Service has been dominated by the urban areas, with rural extensions consisting primarily of pay phones and public call offices at national national post and telecommunications offices (PTT). Now with the addition of mobile and wireless technologies, varying degrees of liberalization are occurring and have opened opportunities for innovative private sector solutions to expand access to rural areas. These include telephone shops and multi-purpose telecentres that introduce an array of retailing innovations including pre-pay cards, messaging services, reverse charge services, and internet access.

While new technology and some liberalization has opened the window on improved rural access to information services, universal access to the rural poor is still severely constrained by two major problems: (i) the market efficiency gap, which refers to the regulatory environment that prevents private entrepreneurs from effectively competing to provide high quality, low cost service levels; this gap could be addressed purely through policy reform, privatization and market liberalization measures; and (ii) the access gap, which recognizes that even liberalized markets will not provide sufficient incentives to extend access to poor rural areas, and thus additional measures and instruments are required to attract investment and service provision to “uneconomic” areas (Dymond, et.al., p. 10-11).

Lessons learned

Early Bank programs focused on large investments for state-owned enterprises. The Bank has moved away from this model and now promotes privatization and private sector-led investment in the sector. Similarly, the IFC has shifted its focus from large fixed investments to smaller cellular operations. This shift and drive toward liberalization has occurred to varying degrees in Africa with South Africa, Ghana and Uganda leading the way. However, there is also a perception that these reforms—aimed primarily at the efficiency gap—are taking too long to reach and may never fully benefit the rural poor.

At the same time, evidence points to the growing demand for telecommunications services among the rural poor. It has been found that across all countries and income groups—including the rural poor—about 2 percent of income is spent on telecommunications (Dymond, et. al. p. 13). Cases abound in rural Africa where once a phone is available, people travel great distances
to use it. Hence, if provided with affordable access, rural households will take advantage of telecommunications services.

Strategy

In view of this situation, the revised strategy is to explicitly address the access gap in telecommunications and information services. This involves a more integrated approach that increasingly focuses on achieving universal, particularly rural, access through a mix of policy reform and targeted pro-poor investment instruments. To this end, four interlocking strategic areas are being pursued (Dymond, et. al. p. 50-66):

i) *establish policies and regulatory instruments to promote universal access* in two areas. The first area includes *market efficiency gap* measures that focus on privatization of state-owned monopolies, foster competition through fair interconnection, revenue-sharing, equitable access, liberalization of retail and new value-added markets, and establish an independent regulatory agency. The second area includes *access gap* measures, that include as the primary vehicle a fund for targeted one-time subsidies for initial investment in service to unserved areas.

ii) *mobilize financing for investments with highest development impact*, which involves coordination with IFC and MIGA to create of investor confidence and reduce risk through explicit measures such as competitively-awarded subsidies, matching grants, or micro-loans to groups or community-based telecentres. These measures could encourage the growing cadre of small telecentres and complement larger IFC investments.

iii) *build institutions and human capacity*, which focus on two levels. The first level is to establish a policy and regulatory process that encourages universal access policies and maintains a propitious framework for private investment. The second level is to build capacity of government agencies and local administrations to use information services to improve public services and to promote improved telecommunications and information services throughout their jurisdictions.

iv) *pilot projects and knowledge-building*, through which innovative approaches for attacking the universal access problem are developed, tested, and monitored. This requires an understanding of the dynamic characteristics of information and telecommunications (ICT) demand in poor rural communities, as well as the regulatory frameworks that will promote universal access policies.

4. Operational Themes

There are several common operational themes that have emerged from the individual sector strategies. These themes are presented below and also summarized in Table 2 with applications to each sector. Table 3 summarizes the related decision-making roles that need to be reinforced within each sector.
A. National sector policy framework

There is a pressing need to establish a policy framework for improved rural infrastructure service delivery. Sustained, quality and affordable service delivery will only succeed in the long run if it is carried out within a positive policy and regulatory environment. Accordingly, all rural infrastructure projects include a mix of national policy reform and improved methods and investment instruments to promote demand-driven service delivery. Each rural infrastructure sector pursues a dialogue with key stakeholders to achieve certain basic policies and institutional frameworks. While many of the basic themes are similar, each sector has a distinct set of policies. These policies should aim to guide and oversee the development of service delivery systems by, among others: (i) assuring the existence of local government capacity to support communities; (ii) facilitate necessary fiscal transfers; (iii) assure appropriate planning and connection to external support networks; and (iv) setting and monitoring technical and management norms.

B. Demand-responsiveness and cost recovery

There is a general agreement among sector practitioners on the need to move away from centrally-managed and supply-dominated approaches to more demand-driven frameworks, in which communities and consumers choose a certain level of service based on their willingness to pay for that service. This willingness to pay is expressed through initial contributions to investment costs and payment of tariffs or user fees to recover O&M expenses. Innovative schemes for cost recovery are evolving for each sector that balance the desire to deliver rural infrastructure services through market arrangements with the goal of ensuring rural infrastructure access to needy areas.

All these schemes involve varying degrees of public-private partnership. The schemes range from one-time “smart subsidies,” micro-credit, micro-finance and investment incentives for the telecommunications and energy sectors, to investment subsidies and full O&M cost-recovery through tariffs for water supply and sanitation services, and finally, to the combination of local contributions, fiscal revenues and national road funds to finance rural road network management.

C. Service-level delivery options

While decentralized service delivery must be demand-driven, the best way to meet this demand is to focus on affordable and sustainably-managed delivery systems. The service-level perspective provides a useful framework within the context of scarce resources. Rural infrastructure programs aim to provide a range of technical options and decision-making frameworks, enabling communities, individuals, and investors to make informed choices based on management, cost and service level alternatives.

Such decision-making frameworks vary by sector. For transport and water supply and sanitation, the investment decision rests principally with the community. In these cases, the initial goal usually is to achieve a “stable” system (one that ensures a minimum level of reliable service to the entire community), and to scale up services as communities grow and demand higher service levels. In the transport case, this decision takes on a broader dimension when considering that
the local road network is part of a larger national network. In both cases, management options include increasing use of private sector providers as the scale and complexity of service increase.

To varying degrees, local governments may promote and manage the selection and implementation of these service options, with assistance of private contractors and service providers. Depending on existing capacities, a technical ministry or independent body still plays an important role in establishing and enforcing quality norms and providing technical support to local governments and communities.

In the rural energy and telecommunications sectors, communities and local governments are less directly involved in investment decisions, but play a role of facilitator and promoter of private investment to ensure basic access. For these sectors, emerging technologies are rapidly changing the landscape of technical options, and are opening up new possibilities to profitably extend access to remote areas, promoted through fiscal incentives and one-time investment subsidies.

D. Cross-sectoral collaboration

The focus on demand-responsiveness has required all rural infrastructure sector programs to take a broader view of their activities within the framework of rural transformation. This has arisen from the understanding that: (i) the demand for various rural infrastructure services derives from a host of other economic and social endeavors; and (ii) the rural infrastructure services underpin many social and economic activities. This view is opening up opportunities for cross-sectoral and multi-sectoral coordination, such as the joint introduction of rural electrification with rural telecommunications facilities. Other examples include rural water supply and sanitation programs, which have strong environmental, hygiene, health and sanitation aspects; and renewable energy programs, which have prominent natural resource management components.

Since the nexus of service delivery generally occurs at the local level, local governments need to become more attuned to these evolving management issues, and supported in their efforts so that they can promote this type of cross-sectoral collaboration and continuous performance improvement.

This broadened perspective has also encouraged the rural infrastructure sectors to follow more private sector and business-oriented approaches to formulate institutional models. Service providers are increasingly obliged to think in terms of assessing and even generating demand for their service and devising ways to continuously respond to that demand over time.

The introduction of private finance and debt management is critical to this scenario, automatically introducing an element of fiscal discipline into the management thinking of the service providers. A second critical element is provision of improved information to empower consumers and communities to make informed choices about service delivery options and costs.

---

3 This addresses a major problem now encountered where there is no debt servicing. In many of these cases, the organization accumulates significant cash balances through tariff collections. When there is not need to pay for at least a portion of the capital investment in the assets, these funds are often misdirected to uses not related to the long term maintenance of these assets, leading to a steady deterioration of the service of asset value and service.
This approach is opening up possibilities for cross-sectoral models, involving parallel efforts to improve financial sector capacity to respond these new opportunities.

E. Capacity-building
The above themes relate to the need to improve the capacity to respond to demand for rural infrastructure services. In each sector, the supply response begins at the national level, and cascades down through the particular complex of private and public decision-makers, including communities and local governments. This translates into programs to: (i) assist the national policy and regulatory institutions to make the transition to facilitator and regulator of efficient and demand-responsive service delivery; (ii) improve the capacity of communities and local governments to apply sector-specific improved tools for selecting, managing or promoting affordable, equitable and quality service delivery, and (iii) strengthen the capacity of the private sector to play an increasing role in investment, management and technical support in service delivery.
Table 2: Operational Themes and Sector Applications

<table>
<thead>
<tr>
<th>Operational Theme</th>
<th>Sector Applications</th>
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<tbody>
<tr>
<td><strong>Rural Transport</strong></td>
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<tr>
<td>National policy framework</td>
<td>- Classify and assign responsibilities.</td>
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<td></td>
<td>- Secure road maintenance financing.</td>
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<td></td>
<td>- Promote network management and service level approaches.</td>
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<td></td>
<td>- Transform role of public sector to facilitator and technical support.</td>
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<td></td>
<td>- Promote transport services and intermediate forms of transport.</td>
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<tr>
<td>Demand-responsiveness and cost</td>
<td>- Within a budget constraint, communities select a level of service in terms of access criteria for all residents.</td>
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<tr>
<td>recovery</td>
<td>- Community cost-share investments and contribute to maintenance, determined by the level of service chosen.</td>
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<td></td>
<td>- Road funds are potential additional source of maintenance financing.</td>
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<tr>
<td>Service level delivery options</td>
<td>- Network management tools help communities visualize access needs.</td>
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<tr>
<td></td>
<td>- Service levels defined in terms of simple criteria (passability, speed).</td>
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<td></td>
<td>- Technical options driven by service levels and costs chosen by the community.</td>
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<td></td>
<td>- Technical options to favor labor-intensive contracting.</td>
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<tr>
<td>Multi-sectoral collaboration</td>
<td>- Holistic perspective to community access and logistics planning.</td>
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<td></td>
<td>- Collaboration with CDD programs.</td>
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<td>- Promotion of gender-sensitive intermediate forms of transport to solve access problems.</td>
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<tr>
<td>Capacity building</td>
<td>- National sector dialogue with public works and rural infrastructure agencies.</td>
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<td></td>
<td>- Pilots for service-level network management.</td>
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<td>- Assistance in creating Road Funds.</td>
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<td>- Targeted training for private and public sectors.</td>
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<td>- Implementation assistance to rural communities.</td>
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<tr>
<td><strong>Rural Water Supply and Sanitation</strong></td>
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<tr>
<td>National policy framework</td>
<td>- Transform national agency to facilitator and regulator.</td>
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<tr>
<td></td>
<td>- Clarify roles of communities, local government and national agency.</td>
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<tr>
<td></td>
<td>- Transfer legal ownership and management to communities.</td>
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<td></td>
<td>- Establish common policy on cost recovery, service levels, and supply chains</td>
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<tr>
<td>Demand-responsiveness and cost</td>
<td>- Communities &quot;self-select&quot; based on expressed demand and through initial contributions.</td>
</tr>
<tr>
<td>recovery</td>
<td>- Community selects service option based on technical, managerial and cost options.</td>
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<td></td>
<td>- All O&amp;M covered by user fees or tariffs.</td>
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<tr>
<td>Service level delivery options</td>
<td>- Water user associations.</td>
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<td></td>
<td>- Community contracting and transparency in procurement.</td>
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<td></td>
<td>- Partnerships with local government, private sector and NGO providers for planning, construction, O&amp;M and management.</td>
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<tr>
<td>Multi-sectoral collaboration</td>
<td>- Integrate health and hygiene education and work with schools and health clinics.</td>
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<td></td>
<td>- Integrated water resource management (IWRM).</td>
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<td></td>
<td>- Promote rural infrastructure cross-linkages (e.g. electricity).</td>
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<td></td>
<td>- Water for commercial use/SMEs in small towns.</td>
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<tr>
<td>Capacity building</td>
<td>- Assistance in transforming national rural water supply and sanitation agencies.</td>
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<td></td>
<td>- Assistance to local governments and communities and water user associations.</td>
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<tr>
<td></td>
<td>- Assistance to private suppliers and NGOs.</td>
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<tr>
<td><strong>Rural Energy</strong></td>
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<tr>
<td>National policy framework</td>
<td>- Transform government role to market enabler for transition to rural electrification.</td>
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<tr>
<td></td>
<td>- Encourage new entrants into electrification and renewables market.</td>
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<tr>
<td></td>
<td>- Devolve woodland ownership and promote market-based solutions for renewables marketing.</td>
</tr>
<tr>
<td>Demand-responsiveness and cost</td>
<td>- Full cost recovery through differentiated or bulk tariffs, as well as cross-subsidies among consumers with varying capacity to pay.</td>
</tr>
<tr>
<td>recovery</td>
<td>- Rural electrification funds to subsidize capital costs for service to targeted regions or consumers, under strict cost-recovery, sustainability criteria.</td>
</tr>
</tbody>
</table>
### Service level delivery options
- Commercial, de-centralized mini-grids for rural electrification.
- Programs that foster local ownership of woodland management and increasing market power of rural residents.
- Public-private partnerships to promote innovative renewable and clean energy solutions.

### Multi-sectoral collaboration
- Cross-linkages with other demand-generating activities for households, enterprises and public services.
- Coordination with urban and other sectors concerning ownership and management of woodlands and charcoal marketing.

### Capacity building
- Assistance in establishing rural energy policy.
- Assistance in liberalizing markets for decentralized electrical supply grids.
- Assistance in reforming ownership and marketing of fuel woods.
- Assistance in mobilizing leverage funding from GEF and eventually CDM.

### Rural Telecommunications and Information
#### National policy framework
- Privatize state-owned industries.
- Liberalize retail and new value-added markets.
- Institute independent regulatory agency.

#### Demand-responsiveness and cost recovery
- Coordination with IFC and MIGA to create investor confidence and reduce risk.
- Competitively-awarded subsidies and matching grants to promote service to needy areas.

#### Service level delivery options
- Wireless technologies to promote decentralized options.
- Community-based telecentres.
- Subsidized investment for highest development impact.

#### Multi-sectoral collaboration
- Promote improved communications, informatics to improve service delivery in other sectors.
- Pursue projects that mutually reinforce demand.

#### Capacity building
- Assistance in privatizing and liberalizing markets.
- Assistance in mobilizing finance.
- Assistance to communities in improving information services.
- Options studies.
<table>
<thead>
<tr>
<th>Decision-level</th>
<th>Rural Transport</th>
<th>Rural Water and Sanitation</th>
<th>Rural Energy</th>
<th>Telecom and Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>- Classify road network</td>
<td>- Clarify roles among natl and local gov't, and communities</td>
<td>- Promote private, decentralized rural electrification and liberalized markets</td>
<td>- Promote private, decentralized wireless-based systems</td>
</tr>
<tr>
<td>Government</td>
<td>- Establish standards</td>
<td>- Establish legal, technical and financial policies</td>
<td>- Promote innovative, clean technologies</td>
<td>- Liberalize framework for new value-added markets</td>
</tr>
<tr>
<td></td>
<td>- Technical support to local gov'ts and communities</td>
<td>- Capacity building and R&amp;D support</td>
<td>- Promote local ownership of renewable resources.</td>
<td>- Institute independent regulatory agency</td>
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<td></td>
<td>- Cost-share with local gov'ts and communities</td>
<td>- Establish import duties to favor IMT</td>
<td></td>
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<tr>
<td>Local Government</td>
<td>- Establish access priorities</td>
<td>- Integrate RWSS in development planning priorities</td>
<td>- Facilitate private investment and promote mutually-supporting investments and projects</td>
<td>- Facilitate private investment and promote mutually-supporting investments and projects.</td>
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<td></td>
<td>- Allocate resources</td>
<td>- Support/backstop community management</td>
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<tr>
<td></td>
<td>- Manage local government network</td>
<td>- Contribute to investment</td>
<td></td>
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<tr>
<td>Community</td>
<td>- Establish access priorities</td>
<td>- Self-select</td>
<td>- Facilitate private investment and promote mutually-supporting investments and projects</td>
<td>- Facilitate private investment and promote mutually-supporting investments and projects.</td>
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<tr>
<td></td>
<td>- Allocate resources</td>
<td>- Make informed choice on service levels</td>
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<td></td>
<td>- Manage community road, track, path networks.</td>
<td>- Contribute to investment</td>
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<td></td>
<td></td>
<td>- Manage system</td>
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<td></td>
<td></td>
<td>- Finance O&amp;M</td>
<td></td>
<td></td>
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<tr>
<td>Private Sector</td>
<td>- Transport industry participate in Road Fund Board</td>
<td>- Support in planning, investment, O&amp;M and service management</td>
<td>- Respond to investment incentives for decentralized and equitable service.</td>
<td>- Respond to investment incentives for decentralized and equitable service.</td>
</tr>
<tr>
<td></td>
<td>- Engineering/works firms respond to market for network management.</td>
<td>- Maintenance and spare parts services.</td>
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<tr>
<td></td>
<td>- Emerging IMT and service industry</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Financial</td>
<td>- Loans for engineering/works.</td>
<td>- Loans to communities for investment and management.</td>
<td>- Respond to incentives to finance decentralized and equitable service.</td>
<td>- Respond to incentives to finance decentralized and equitable service.</td>
</tr>
<tr>
<td>sector</td>
<td>- Loans for transport industry and intermediate forms of transport</td>
<td>- Loans to SMEs, contractors, etc</td>
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</tbody>
</table>

21
5. Conclusion

Vision and Common Agenda

The overall rural infrastructure vision in Africa is the provision of affordable and sustained rural infrastructure services that contribute to rural transformation. The vision is based upon an integrated approach that puts community and local governments at the forefront without neglecting the policy and institutional reforms required by the various sectors. Table 4 presents the overall vision and how it translates at the sectoral level.

The individual sectors share the need to build on recent advances in achieving affordable, quality and sustainable service delivery systems in Africa. This involves persistent sector dialogues at the national level, combined with continuous application, testing and improvement of service delivery options at the community and local government level. Individual sectors are exploring and testing new institutional models that capitalize on the trend toward market liberalization, private capital mobilization, and decentralized development.

A fresh perspective on how to achieve coherence between demand and supply for rural infrastructure services underlies these new models. The new perspective is characterized by: (i) a demand-responsive framework that empowers consumers to express their demand and willingness to pay for services; (ii) more private sector and business-oriented approaches to service delivery that oblige service providers to respond to demand and achieve financial sustainability, (iii) an opportunistic approach to capture cross-sectoral demand and supply linkages and synergies among the rural infrastructure sectors, and (iv) advocacy of the rural infrastructure service delivery approach within the broader rural development agenda to ensure that the emerging institutional models and synergies are incorporated into the CDD framework.

Table 4: Rural Infrastructure Vision (overall and by sector)

<table>
<thead>
<tr>
<th>Overall Vision: Affordable and sustained provision of rural infrastructure services for rural transformation.</th>
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<tbody>
<tr>
<td><strong>Rural Transport</strong></td>
</tr>
<tr>
<td>Decentralized entities assure minimum and equitable access to their residents.</td>
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<tr>
<td>Community and local government networks are managed based on affordable and chosen service levels.</td>
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<tr>
<td>Community and local government network management linked to national networks.</td>
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<tr>
<td>Investment financing through public transfers and cost-sharing.</td>
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<tr>
<td>O&amp;M financing through cost-sharing, user fees, fiscal receipts and transfers.</td>
</tr>
<tr>
<td>Affordable transport services are provided.</td>
</tr>
<tr>
<td><strong>Rural Water Supply and sanitation</strong></td>
</tr>
<tr>
<td>Communities and local governments assure, through private or concessionary management, sustained provision of chosen levels of improved services.</td>
</tr>
<tr>
<td>Investment financing through public transfers, targeted subsidies, or debt management.</td>
</tr>
<tr>
<td>O&amp;M financing through user tariffs.</td>
</tr>
<tr>
<td><strong>Rural Energy</strong></td>
</tr>
<tr>
<td>Increasing access to improved energy services, in particular electricity, through commercially managed and decentralized systems in a liberal market environment.</td>
</tr>
<tr>
<td>Investment financing entirely through private sector with targeted subsidies.</td>
</tr>
<tr>
<td>O&amp;M financing through user tariffs.</td>
</tr>
<tr>
<td><strong>Rural Telecommunications and information</strong></td>
</tr>
<tr>
<td>Increasing access to telecommunication and information services through commercially-managed and decentralized systems in a liberal market environment.</td>
</tr>
<tr>
<td>Investment financing entirely through the private sector with targeted subsidies.</td>
</tr>
<tr>
<td>O&amp;M financing through user tariffs.</td>
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</tbody>
</table>
The next step is for each sector to put this vision into action. The common agenda for doing so is outlined below.

i) Develop and refine sector-specific policies and institutional options for rural infrastructure
   - Guidelines and toolkits for sectoral reform interventions and programmatic approaches
   - Guidelines and toolkits for sectoral interventions in multisectoral context

ii) Pursue opportunities for cross-family and cross-network linkages
    - Collaboration at country level (CAS, PRSP) and project/program level to ensure rural infrastructure contributions to overall rural development agenda in country
    - Develop sector-specific delivery systems that are mutually-reinforcing with the CDD approach

iii) Improve effectiveness of rural development interventions through knowledge development and learning.
    - Pilot projects to test new approaches such as multi-sectoral rural infrastructure projects
    - Studies on linkages with financial sector, consumer credit and smart subsidies
    - Improved M&E to measure effectiveness and sustainability of our interventions

iv) Capacity building for AFR infrastructure and non-infrastructure staff
    - Clinics to review sectoral guidelines and toolkits
    - Learning events on cross-cutting themes such as decentralization
References

Rural Infrastructure


Rural Transport


Lebo, Jerry and Dieter Schelling, *Design and Appraisal of Rural Infrastructure: Ensuring Basic Access to Rural Communities* (Draft World Bank Technical Paper)


Starkey, Paul, *Intermediate Means of Transport: People, Paradoxes and Progress*, University of Reading Animal Traction Department, for Rural Travel and Transport Program, Sub-Saharan Africa Transport Policy Program.

Rural Water Supply and Sanitation


Rural Energy


Foley, Gerald, From Crisis to Opportunity – Towards Sustainable Management of the Dry Tropical Woodlands for Woodfuel, Summary of draft discussion paper Sustainable Woodfuels Supplies from the Tropical Woodlands for ESMAP.


World Bank, Regional Program for the Traditional Energy Sector (RPTES), Update Brief – September 2000.


Rural Telecommunications and Information


Rural Finance


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Rural Infrastructure in Africa: Policy Directions

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