

Towards Better Performance of Infrastructure Management in Developing Countries

By

Sulyman, A. O.

Department of Urban and Regional Planning,
Federal University of Technology, Minna, Nigeria.

Abstract: *The developing countries have allocated on average one-third to over one-half of public investment to infrastructure sectors, yet many still lack adequate services like water and sanitation, electricity, roads, storm water drainage, telecommunication and wastes disposal. It is against this background that this paper attempts to discuss new management and financing approaches for better performance of infrastructure especially in the developing countries. Consequently, the paper discusses the role of infrastructure in development and identifies reasons for its poor performance. New management approaches which include application of commercial principles of operations, broadening of competition and users involvement are proposed. Similarly new financing options which include Public-Private partnership (PPP), self-help and the use of bonds are recommended for better performance of infrastructure in developing countries.*

Keywords: Infrastructure, Development, Public-Private Partnership, Urban Finance, Urban Management

Introduction: In virtually all the existing urban centers in developing countries the provision of basic infrastructure of water and sanitation, electricity, roads and stormwater drainage, telecommunication and safe disposal of wastes to communities do not meet the demands of their rapidly growing population (World bank, 1994, Kaigama, 1995). In realization of this fact, governments of developing countries are making effort in the provision of infrastructure both in urban and rural areas so as to enhance societal welfare and foster economic growth and development. For example, World Bank (1994) reports that developing countries invest \$200 billion a year in new infrastructure, which is 4 percent of their national output and a fifth of their total investment. The result has been a dramatic increase in infrastructure services for transport, power, water sanitation, telecommunication and irrigation. Despite the strong emphasis, however, the full benefits of past investments are not being realized, resulting in wastage of scarce resources and loss of economic opportunities.

Similarly, McNeil (1993) reports that the developing countries have allocated on average

one-third to over one-half of public investment to infrastructure sectors, yet many still Lack adequate services. This is because traffic clogs urban streets, water and sewerage facilities are non-existent or vastly overworked, and facilities fail to provide reliable sources of power. Also, the World Bank (1994) reports that one billion people in developing World still lack access to clean water and nearly two billion lack adequate sanitation and that in the rural areas especially, woman and children often spend long hours fetching water (Fawehinmi, 2003). It reports further that inadequate transport networks are deteriorating rapidly in many countries, while electric power has yet to reach two billion people and in may countries unreliable power constraints output. The report concluded that the demands for telecommunications to modernize production and enhance international competitiveness far outstrip existing capacity.

The condition of Nigeria infrastructure is generally poor. For example, World Bank (1996) reports that Nigeria's urban infrastructure is crumbling because water supply, sewerage, sanitation, drainage, roads, electricity, waste

disposal all suffer from years of serious neglect. Similarly, a Federal Republic of Nigeria (1997) report that the rate at which community infrastructure and social services are provided in Nigeria does not commensurate with the pace of population growth and expansion. As a result, infrastructure problems now plague all the urban centers in Nigeria and these included irregular water supply, unreliable energy supply, poor drainage, inefficient waste disposal system, grossly overstretched intra-city, inter-city and inter-state transportation systems. It was equally noted that in most Nigerian cities, urban infrastructure, are poorly provided and maintained. Consequently, the inadequacy and poor quality of urban infrastructural facilities and services undermined economic efficiency and compromise the competitiveness of Nigerian cities in the global economic arena (Federal Republic of Nigeria, 2012). It is against this background that this paper attempts to discuss new management and financing approaches for better performance of infrastructure especially in the developing countries.

Concept of Infrastructure

Fox (1994) defines infrastructure as those services derived from the set of public work traditionally supported by the public sector to enhance private sector production and to allow for household consumption. Ugwu (1993) identifies three typical characteristics of infrastructure. These include technical characteristic which is indivisibility and long Life span among other; economic characteristic that is external effects and economy of scale, high fixed capital and social costs, high risk investment; and institutional characteristic which include absence from market prices, central planning and allocation, control among others.

World Bank (1994) states the composition of economic infrastructure to include public utilities which consist of power, telecommunication, piped water supply, sanitation, and sewerage solid water, waste collection and disposal and piped gas; public works which consist of roads and major dam and

canal works for irrigation and drainage; and other transport sectors which consist of urban and inter-urban railways, urban transport, ports and waterways and airports.

Obateru (2003) distinguishes between physical infrastructure comprising transportation facilities and public utilities and social infrastructure comprising social (community) facilities and services. Examples of public utilities include electricity, water and gas supply sewerage, storm water drainage and telephone service; while examples of social or community facilities include educational, health, recreational and cultural facilities. Examples of social services include police and fire protection.

Schubeler (1996) differentiates between urban infrastructure services and social infrastructure. Urban infrastructure refers to services traditionally provided by the public works, transport sectors and utilities. Examples of the above include roads, mass transportation, water supply, drainage and flood protection, sewage, solid waste collection and disposal, power distribution, Street lighting and telecommunication. The social Infrastructure on the other hand refers to health, educational, recreational and cultural facilities.

Impact of Infrastructure on Development

The impact of infrastructure on development of a community or a nation cannot be over emphasized. However, the precise linkages between infrastructure and development are still open to debate (World Bank, 1994). Firstly, infrastructure can deliver major benefits in economic growth. McNeil (1993) argues that adequate infrastructure reduces the cost of production, which affects profitability, levels of output, and employment, particularly in small-scale business and that when infrastructure "works" productivity and labour increase and when it does not work, economic renewal can be postponed or even halted. Similarly, World Bank (1994) reports that good infrastructure raises productivity and lowers production cost, but it has to expand fast enough to accommodate growth. However, it has been established that infrastructure capacity grows step by step with economic output that is a

1 percent increase in the stock of infrastructure is associated with 1 percent increase in gross domestic product (GDP) across all countries. (World Bank, 1994; Fawehinmi, 2003).

Secondly, apart from economic considerations, inadequate infrastructure affects the health and well-being of citizens (McNeil, 1993). With infrastructure in place and performing, there is a great chance of healthier citizens. The most obvious example is the provision of improved water supply. Several diseases are caused by the scarcity of drinking and bathing water especially water-borne diseases like typhoid fever, cholera, dysentery; water-washed diseases like scabies; and water related diseases such as schistosomiasis, guinea worm and so on (Fawehinmi 2003). Fawehinmi (2003), reports that improved water and sanitation in developing countries on average reduces diarrhoea by 22 percent, round worm by 28 percent, Guinea worm by 76 percent and schistosomiasis by 73 percent and that diarrhoea death rates were typically 60 percent lower among children with adequate sanitation water. World Bank (1994) reports that poor management of solid wastes complicate urban street drainage and has been linked with the proliferation of disease bearing mosquitoes in standing water.

Thirdly, provision of infrastructure, its sustenance and flow of services from it all have direct effect on the level of poverty of individuals in those communities (Fawehinmi 2003). Infrastructure, thus affects the dimensions of poverty and in the developing countries it has become a central poverty issue. Infrastructure has the power to determine the quality of life for residents, particularly in urban areas. (McNeil, 1993). This is because neighborhoods often arise around infrastructure services and they contribute to community's cohesion and livelihood. Mabogunje (1993), reports that urban planning was also transformed to take account of the need to extend infrastructural facilities and services to individual plots of land within the city. Consequently, the links between urban infrastructural provision, urban land management thus became an intricate and

essential web in the development of modern city.

Performance of Infrastructure in Developing Countries

In developing countries, governments own, operate and finance nearly all infrastructure, primarily because its production characteristics and the public interest involved were thought to require monopoly and hence government provision. Consequently, the record of success and failure in infrastructure is largely a story of governments performance (World Bank, 1994).

McNeil (1993) reports that the static concept of infrastructure has failed to recognise that infrastructure is an ongoing process of delivering services. Consequently, funding of operation and maintenance, training and rewarding of staff to run the facilities, and institutional and policy reform often have not been given adequate attention in project design. Emphasis instead has been on resources to construct and expand physical assets while much time has not been devoted to thinking through infrastructure's long time up-keep, or even genuine demand for the services. Similarly, Schuttenbelt and Lorentzen (1994) argue that the traditional supply orientation to infrastructure policy has tended to over emphasize public sector provision and excessive political involvement in decisions about investment and pricing.

Wegelin (1996) reports that infrastructure investments too often have been made without adequate attention to cross-sectorial linkages. As a result many cities are burdened with capital projects that can no longer function at their designed capacity or allocated in wrong places. Consequently they often require so much funding that they displace other more useful projects. These developments, in turn, have resulted in haphazard investments in new assets, inadequate operation and maintenance, non-sustainability and unreliability of services, constraints to economic productivity and environmental degradation.

New Reform for Management and Financing of Infrastructure in Developing Countries

Schuttenbelt and Lorentzen, (1994) report that experiences of the past decades confirm that the solution to infrastructure problems is not merely to expand capacity by making new investments. The key reform is to deliver infrastructure services that users need and are willing and able to pay for infrastructure service delivery which should respond to providers whose demand, can be identified; services should then be provided in a sustainable way. This requires a level of management and financial resources often beyond the reach of Local Government in developing Countries. It is in realization of the above that World Bank (1994) advocates three measures to reform the provision of infrastructure services namely, the wider application of commercial principles to service providers, the broader use of competition and increased involvement of users where commercial and competitive behaviour is constrained.

Applying commercial principles of operation involves giving service providers focused and explicit performance objectives, well-defined budgets based on revenues from users, and managerial and financial autonomy; while holding them accountable for their performance. Consequently, this implies that governments should not only refrain from adhoc interventions in the management but should provide explicit transfers where needed, to meet social objectives such as public services obligations. In other words, private sector involvement in the management, financing or ownership will in most cases be needed to ensure a lasting commercial orientation of infrastructure.

Secondly, broadening competition means arranging for suppliers to compete for entire market (World Bank, 1994). Ezirim(2003), reports that a fundamental characteristics of competitive markets is that they provide incentives, and disincentives for effective institutional performance. Competition causes pressure thereby reducing discretionary behaviour in an organization, and imposing a discipline that leads to improved performance.

For these reasons, the simplest most effective way to achieve a demand orientation is to expand the realm of competitive markets. The larger the proportion of infrastructure services, that operated in reasonably competitive the better. Thirdly, involving users more in project design and operation of infrastructure activities where commercial and competitive behavior is constrained provides the information needed to make suppliers more accountable to their customers. Involvement of users and other Stakeholders can include consultation during project planning, direct participation in operation or maintenance and monitoring. It should be noted the people as consumers and producers of infrastructure services, and as citizen influence the flow and quality of infrastructure services available to them (Ezerim, 2003).

World Bank (1994) reports that numerous example of past failures in public provision, combined with growing evidence of more efficient and user- responsive private provision argue for a significant increase in private involvement in financing operation, and in many cases ownership. However, the rate at which to increases private involvement in the provision of infrastructure in any country will depend on the strength of the private sector, the administrative capacity of the government to regulate private suppliers, the performance of public sector providers, and the political consensus for private provision. With this in mind, menu of four main options for ownership and provision, which must be tailored to fit country's need as set out by the World Bank (1994) are proposed bellow:

(i) Option A: Public ownership and Public Operation.

Public provision by a government department, public enterprise, or parastatal authority is most common form of infrastructure ownership and operation. Successful public entities run on commercial principle and give managers control over operations and freedom from political interference, but they also hold managers accountable, often through performance agreements or management contracts. This option follow sound business practices and is

subject to the same regulatory, labour law, accounting, and compensation standards and practices as private firms. Tariffs are set to cover costs, and any subsidies to the enterprise are given for specific services and in fixed amounts. The success level of option A is usually low because of its vulnerability to changes in governmental support.

(ii) Option B: Public ownership with private operation

This option is typically implemented through lease contracts for full operation and maintenance of publicly owned infrastructure facilities, or through concessions, which include responsibility for construction and financing of new capacity. Arrangements between the owner (government) and the operator (firm) are set out in a contract that includes any regulatory provisions. The private operator typically assumes all commercial risk of operation and shares in investment risk under concessions. Concessions also include contract to build and operate new facilities under BOT arrangement and its variants.

(iii) Option C: Private ownership and private operation.

The use of this option is increasing both through new entry by private firms in infrastructure markets and through divestiture of public ownership of entire systems. Private ownership is straight forward when services can be provided competitively and in many infrastructure sectors, it is possible to identify such activities and allow private provision. Private firms are able to respond to local needs efficiently and flexibly, and market forces and competition encourage innovation and economy to ensure responsiveness to demand. This is largely because the private sectors survival depends on meeting the needs of consumer on a competitive basis. It should be noted that while it is becoming widely acceptable that the private sector can be effective in improving infrastructure productivity, it can be difficult for them to function well if a dear framework and a favourable business climate are not in place (World Bank, 1994; Ezirim, 2003).

(iv) Option D: Community and users provision. This option is most common for local, small scale infrastructure such as rural feeder roads, community water supply and sanitation, distribution canals for irrigation; and maintenance of local drainage systems and it often compliments central or provincial services. Successful community provision requires users involvement in decision making, especially to set priorities for expenditures and to ensure an equitable and agreed sharing of the benefits and cost of service provision. Technical assistance, training, and compensation of service operators are also very important. When these elements are present, community self-help programmes can succeed over long periods.

Implementing the above institutional options and mobilizing funds to expand and improve services required carefully designed financing strategies (World Bank, 1994). Consequently, foreign and domestic sources of finance will need to be tapped but are limited to the capacity of any economy to obtain funds from abroad especially debt finance. With the above in mind the following are proposed:

(I) Public Private partnership (PPP): Public Private Partnerships are based on involving different actors of stakeholders which include the public sector, the formal private sector, the informal private sectors and the community and its representatives in financing infrastructure (Schuttenbelt and Lorentzen, 1994). The most common type of partnership arrangement in developing countries is contracting out. However, with increasing greater responsibilities by the government, a broader range of partnership options should be considered, these include Build-Operate Transfer (BOT) and its variants. BOT is a partnership between public and private sectors whereby the private firm is authorized to build, operate an asset or service which will be transferred to the public sector after a period of time. The BOT variants include BOO (Build-Own-Operate) in which there is no transfer back to the public sector, BOOT (Build-Own-Operate Transfer) with special 1 for transfer and training, BROT (Build-Rent-Operate-Transfer) DBO (Develop Build Operate) and ROT (Refurbish

Environmental Issues

Operate- Transfer).

(ii) Self-help: Mobilizing labour and capital to construct small scale local infrastructure is one of the most common techniques for supplementing public resources with varying degrees of organization and varying amounts of state support (Ezirim, 2003). At the implementation stage, two distinct features will have to be considered, namely sharing of cost and furnishing of labour. Cost sharing is achieved by making those residents who will benefit bear the cost or to let them freely make donations according to their perceived interests. However, it should be noted that for projects aimed at improving essential facilities it should be by means of compulsory cost sharing while free donation method should be adopted for construction of non-essential infrastructure facilities. Sharing of labour is also achieved by a direct contribution of labour or costing the monetary equivalent of one share of Labour and then getting the money back in form of wages by personally participating in the work.

(iii) Bond: Municipal bonds can be issued to the public as a way of financing infrastructure projects. Bond is a long-term debt instrument where the holders are creditors. The private sector enterprises for infrastructure development if well positioned can adopt this arrangement of infrastructure financing. This method of financing is suitable for large projects such as road construction and urban water supply. The contract agreement is usually tailored to the needs of the sponsors of the project as well as the needs of potential suppliers of capital (or creditors) who may even be the beneficiaries of the project. It should be noted that to ensure sustainable delivery of infrastructure services, provision should be made in the contract debt to exert some influence upon the direction of the company in respect of the project.

Conclusion

The developing countries have allocated on average one third to over one-half of public investment to infrastructure sectors. Yet many still lack adequate services like water and sanitation, electricity, roads, storm water

drainage, telecommunication and wastes disposal (McNeil, 1993, World Bank, 1991). This paper has attempted a discussion of approaches for better performance of infrastructure in developing countries. New management approaches which include application of commercial principles of operation, broadening of competition and users' involvement are proposed, while new financing options which include Public-Private Partnership, self-help and the use of bonds are recommended. It is hoped that the approaches discussed in this paper will be more efficient, more user-responsive, more environment friendly, and more resourceful in using both the public and private sectors for better infrastructure performance in the developing countries.

References

Ezirim, O.N. (2003). Infrastructure Development: The Institutional options for Demand Oriented services Management. Paper presented at the 34th Annual Conference of the Nigerian Institute of Town Planners (NITP) at Abeokuta.

Fawehinmi, V. (2003), Infrastructure and Human Development: A General Introduction", In Fawehinmi, Y. (ed) *Urban Finance and Infrastructural Development in Nigeria*, Ibadan: Institute of Land Economics and Atlantis Books.

Federal Republic of Nigeria (1997), *National Urban Development Policy*. Abuja. Federal Ministry of Works and Housing.

Federal Republic of Nigeria (2012), *National Urban Development Policy*. Abuja, Federal Ministry of Lands, Housing and Urban Development.

Fox, W.F. (1994), *Strategic Options for Urban Infrastructure Management*. Urban Management Programme (UMP) paper 17, The World Bank.

Environmental Issues

Kaigama, B.B., (1995), Evaluation of Institutional Strategies for the Provision of Urban Infrastructure in Developing Countries. Urban Field Seminar presented at the Department of Urban and Regional Planning, AhmaduBello University Zaria.

Iseh, F. (2003), The state of Urban infrastructure in Nigeria in Fawehinmi Y. *Urban Finance and infrastructural Development in Nigeria*. Ibadan: Institution of Land Economics and Atlantis Books

Mabogunje, A (1993). Infrastructure: The crux of modern Urban Development. *The Urban Age* 1(3)3

McNeil, M. (1993), The Changing Nature of Infrastructure, *The Urban Age* 1(3): 1 – 4.

Obateru, O. I. (2003), *Land Subdivision Basics*. Ibadan: Penthouse Publications (Nig.)

Schubeler, P. (1996), *Participation and Partnership Infrastructure Management*. Urban Management Programme (UMP). The World Bank.

Schuttenbelt, P. and Lorenzten, J. (1994), Public Private Partnerships in Municipal Infrastructure Services *The Urban Age* 2(4).

Ugwu, I.C. (1993), Consideration for Financing Urban Infrastructure Development. at *Paper presented at the 24th Annual Conference of Nigerian Institute of Town Planners (NITP)* Yola.

Wegelin, E.A. (1996), The Urban Management Programme (UMP): Integrated Urban Infrastructure Development and Management information Systems, *ITC Journal*: 2-9.

World Bank (1994), World Development Report 1994: Infrastructure for Development. New York: Oxford University Press.

World Bank (1996), Restoring Urban Infrastructure and Services in Nigeria *Finding Africa Region* 3(6) 1-3.

ISSN 1118-2083

ENVIRONMENTAL ISSUES

Vol. 4, 2011:
Vol. 5, 2012:
and
Vol. 6, 2013.

Published by
Department of Geography
and Environmental Management,
University of Ibadan,
Ibadan, Nigeria.