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INFRASTRUCTURE AND ECONOMIC DEVELOPMENT: THE NIGERIAN EXPERIENCE

By

Chief A. P. Awoseyila*

INTRODUCTION

Infrastructure services are central to the activities of households and to economic production. The development of infrastructure generally enhances welfare and foster economic growth. Major infrastructure failures occasioned by natural disasters or civil disturbances such as destruction of power stations, roads and bridges and water supply could radically reduce communities' quality of life and productivity. Thus, providing infrastructure services to meet the demand of businesses and households, is one of the major challenges of economic development.

Coping with future challenges of providing infrastructure involves much more than drawing up inventories of projects and plotting needed investments on the basis of past patterns. It involves tackling inefficiency and waste both in investment and in delivering services, and responding more effectively to users' demand. The special technical and economic characteristics of infrastructure make it imperative for government to play an essential role in its provision. However, dominant and pervasive intervention by governments has in many cases, failed to promote efficient or responsive delivery of such services. Recent changes in thinking and technology have revealed increased scope for commercial principles infrastructure provision. These offer new ways to harness market forces even where typical competition would fail. Thus, an evaluation of the role of government in infrastructure development is leading to shift from direct government provision of services to increasing private sector provision as observed recently in many countries with public/private partnership in providing various economic infrastructure.

The main focus of this paper is to analyse the role of infrastructure in national economic development and to trace Nigeria's efforts in providing economic infrastructure services in recent years. For ease of exposition, the discussion of the paper is organised into four parts. Part I analyses the role of infrastructure in economic development while Part II reviews the state of infrastructure services in Nigeria from 1986 to 1995. In Part

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III, the focus is on policy issues and options while Part IV provides a summary and conclusion.

PART I THE ROLE OF INFRASTRUCTURE IN ECONOMIC DEVELOPMENT

(a) Definition

Infrastructure should be seen as an umbrella term for many facilities generally referred to as “social overhead capital”. The focus of this definition is on economic infrastructure which is distinct from social infrastructure such as educational and health care delivery services. Economic infrastructure is the inner or engineered structures, and/or structures of component parts, such as a system of equipment and facilities and the services they provide that are used in economic production. Infrastructure include public utilities (power, gas, telecommunications, and water supply) public works (roads, bridges, dams and canals) and other transport facilities and services (railway, seaports and airports). As defined here, infrastructure covers complex and distinct services and by any measure represent a large share of capital formation in the economy. According to the World Bank National Accounts Data (1990) the services associated with the use of infrastructure (measured in terms of value-added) accounted for roughly 7.0 to 11.0 per cent of GDP (Table 1). Transport being the largest sector alone absorbed 5.0 to 9.0 per cent across various country groups.

(b) Characteristics of Infrastructure

Infrastructure’s large and varied potential impacts on development derived from certain technological and economic characteristics that distinguish it from most other goods and services. These characteristics make infrastructure subject to special policy attention. The most general economic characteristic of modern infrastructure is the supply of services through a networked delivery system designed to serve a multitude of users, particularly public utilities such as piped borne water, electric power, gas, telecommunications, sewage and rail services. Investments in the delivery system (such as underground water pipes or electric wires) are mostly irrecoverable because they cannot be converted to other uses or moved elsewhere - unlike the investment in a vehicle, for example. Once paid, these costs are said to be “sunk”. Because the delivery system is networked, coordination of service flows (traffic, electricity, communications

signals) along the system is critical to its efficiency. This interconnection also means that the benefits from investment at one point in the network can depend significantly on service flows and capacities at other points.

Infrastructure investment is not sufficient on its own to generate sustained increases in economic growth. The demand for infrastructure services is itself sensitive to economic growth, which is notoriously difficult to predict. The economic impact of infrastructure investment varies not only by sector but also by its design, location, and timeliness. The effectiveness of infrastructure investment - whether it provides the kind of services valued by users (responding to "effective demand" depends on characteristics such as quality, reliability, availability, as well as the efficiency with which infrastructure services are provided.

(c) **Infrastructure's Role**

The adequacy of infrastructure determines a country's success and another's failure in diversifying production, expanding trade, coping with population growth, reducing poverty, or improving environmental conditions. A good infrastructure raises productivity and lowers production costs, although the precise linkages between infrastructure and development are still open to debate. However, according to the World Development Report 1994 infrastructure capacity grows step for step with economic output - a one per cent increase in the stock of infrastructure is associated with a one per cent increase in gross domestic production (GDP) across all countries. And as countries develop, infrastructure must adapt to support changing patterns of demand.

The kind of infrastructure put in place also determines the pattern of income distribution. Poverty alleviation in rural areas, and the growth of farm productivity and non-farm rural employment is linked closely to infrastructure provision.

Infrastructure services that help the poor also contribute to environmental sustainability. Clean water and sanitation, non-polluting sources of power, safe disposal of solid waste, and better management of traffic in urban areas provide environmental benefits for all income groups. The urban poor often benefit most directly from good infrastructure services which mitigates squalid living conditions characteristic of concentrated settlements such as unsanitary conditions, hazardous emissions, and accident risks.

Integrated urban planning and transport policy can lead to more efficient use of both land and transport capacity with favourable environmental results. Expansion of transport infrastructure can reduce total pollution loads as congestion falls, average

vehicle speeds rise, and routes are shortened. But road improvements can also encourage vehicle use and increase emissions. Therefore, additions to infrastructure capacity are only part of the solution. Improved management of traffic and land use and promotion of non-motorized modes, cleaner fuels, and public transport are also important.

(d) Links To Poverty Alleviation

Infrastructure is important for ensuring that growth is consistent with poverty reduction, a topic covered extensively in World Development Report 1990 which noted that access to at least minimal infrastructure services is one of the essential criteria for defining welfare. To a great extent, the poor can be identified as those who are unable to consume a basic quantity of clean water and who are subject to unsanitary surroundings, with extremely limited mobility or communications beyond their immediate settlement. As a result, they have more health problems and fewer employment opportunities. The burgeoning squatter communities surrounding most cities in developing countries typically lack formal infrastructure of facilities, a condition arising from the non-permanent nature of their tenure. The construction and maintenance of some infrastructure - especially roads and water-works - can contribute to poverty alleviation. By providing direct employment, civil works programs which often accompany the provision of infrastructure, have also been important in strengthening famine prevention and providing income.

(e) Links to the Environment

Infrastructure provision results from the efforts of individuals and communities to modify their physical surroundings or habitat in order to improve their comfort, productivity, and protection from dangerous elements. Each sector - water, power, transport, sanitation, irrigation - raises issue concerning the interaction between man-made structures (and the activities they generate) and the natural environment.

Environment-friendly infrastructure services are essential for improving living standards and offering public health protection. With sufficient care, providing the infrastructure necessary for growth and poverty reduction can be consistent with concern for natural resources management and environmental protection. At the same time, well-designed and managed infrastructure can promote the environment and sustainability of human settlements.

PART II

2.0 THE STATE AND QUALITY OF INFRASTRUCTURAL FACILITIES IN NIGERIA

2.1 State of Infrastructure

One of the major areas in which the National Economic Development Plans have made significant impact is in infrastructural development. There had been substantial investment in the transport sector namely in road construction, seaport and airport developments. Also, communications and telecommunication facilities have been installed while huge investment has been made in electric power generation and distribution. The ownership and investment in infrastructural facilities in Nigeria has been predominantly government (the Federal and State Government Agencies). In the period 1991 to 1995, infrastructure has contributed an average of 4.02 per cent to the GDP while the transport sub-sector contributed the bulk, about 3.17 per cent of the GDP (Table 2). In what follows, an attempt will be made to analyse in detail the state of each infrastructural facility put in place.

2.1.1 Transportation

(a) Road

Construction and maintenance of roads and bridges until recently had been the concurrent preserve of the three tiers of government in Nigeria. Thus, of the total road network of approximately 171,328 kilometres, Federal highways constituted 32,100 km, State roads were 30,548 km while the balance (108,670) were Local Government roads of the Federal highway network which forms the primary axis of the system, 23,993 km are paved while 8,107 km were unpaved. Although, many nooks and corners of the country are well linked, it should be noted that the fortunes of road segment of the transport sub-sector change with the condition of the economy. To this end, while most of the rural areas have not been connected with the nation's road network as a result of dwindling public sector revenue, the same reason has accounted for the state of disrepair of both urban roads and federal highways. In view of this, the Federal Government has embraced private sector participation in road maintenance option for its highways. This is by way of charging tolls in selected Federal highways with the aim that the fund realised would complement budgetary allocation for road maintenance.

(b) Seaport

This is an area where facilities had been adequately provided. In fact substantial investments have been made to develop the nation's seaports in Lagos, (Apapa and Tincan Island) Calabar, Port-Harcourt, Sapele and Warri and other numerous jetties located in the riverine areas. The facilities put in place have handled the nation's external trade since independence. In order to improve facilities for maritime business especially local participation in this sector, the government established the Nigerian National Shipping Line (NNSL). However, NNSL was liquidated in 1992 largely on account of persistent poor operating results and was replaced by the Nigerian Shipping Company. The National Maritime Authority (NMA) was also established in 1987 to aid the development of indigenous shipping activities as well as implement the 40-40-20 cargoes sharing formula of the UNCTAD aimed at encouraging developing countries in participating on the freight of their merchandise cargo. In this regard, the NMA has been very active especially on the allocation of cargoes to indigenous shipping lines as well as rendering financial services to these companies in the maintenance and acquisition of ships.

Shipping activities have however, been predicated on the trend in merchandise trade. For instance, the number of ships that entered and departed Nigeria as well as the volume of non-oil shipment were at their peaks between 1975 and 1985 when the economy thrived (Table 3).

(c) Airport

Air mode of transportation received a boost from the oil boom era of post civil war Nigeria. The number of airports grew from just about four in 1970 to over a dozen airports and half a dozen air strips across the country. Of this, four airports located in Lagos, Abuja, Kano, Port Harcourt and Calabar are of international status. However, due to the depressed economic situation in recent times and as a result of low effective demand, most of the local airports had to be rationalised. In addition to the development and management of the airports, the Nigeria Airways was established to airlift passengers and freight on both local and international route. The private sector had since responded positively to incentives offered by the airport development by investing in airline services business. This has engendered competition in the domestic airline services and consequently, improved on air transportation which has augured well for passenger comfort.

(d) Railway

The Nigerian Railway Corporation (NRC) was established in 1955. It has strived to maintain the rail transportation system for bulk carriage of goods and passengers. This Corporation has attracted long distance travellers on routes like Lagos - Kano, Port Harcourt - Kano, Lagos - Jos, Lagos - Maiduguri, Port Harcourt - Jos and Enugu - Maiduguri, etc. The NRC has been able to increase the kilometrage of rail tracks from 2048 km at inception of 3505 km at present. However, the NRC's performance has not been quite satisfactory over the years. Congestions and frequent delays as well as cancellation of travel schedules have become regular feature of passenger train operations. Freights have also not been moved promptly. These inefficiencies have been attributed to various reasons, including poor funding, unserviced tracks, coaches, wagons and locomotives; acute shortage of maintenance locomotives, spare parts and repair kits; delays or non-payment of salaries; strikes and poor management. For instance, the number of locomotives has decreased from 219 at the inception of the Corporation to less than 75 by 1995. Consequently, the number of passengers carried has declined from the peak of 15 million in 1984 to 2.9 million in 1995 and the tonnage of goods carried has also diminished from 111 million in 1979 to 0.1 million in 1995.

(e) Communication

Telecommunication and postal facilities and services have also been developed on network basis as an essential medium of relating with distant places or sending messages and letter. Data available from the Nigerian Telecommunications Limited (NITEL) showed that as at 1994, 405.6 million telephone sets and 7,280 telex sets were available in the country (Table 4). Similarly, data on the activities of the Nigerian Postal Services (NIPOST) during the same period showed a total of 3,623 postal facilities; 788 of which were full-fledge post offices, 2687 postal agencies while the remaining 148 were sub-post offices. Apart from the official provision of facilities, private firms have also been involved in the provision of both postal and telecommunication services. However, in spite of all these efforts, Nigeria is still grossly under-served with communication facilities. Secondly, the time taken by correspondence from one place to another through NIPOST is still very long while the number of successful telephone dial calls continue to diminish.

(f) Power**(i) Electric Power**

Electric power generation and supply in Nigeria is undertaken by a government parastatal known as the National Electric Power Authority (NEPA) which evolved from the erstwhile Electricity Corporation of Nigeria (ECN), established in 1950 and which existed up till 1970. To meet up with the ever increasing demand for electricity, NEPA developed additional electricity generating and transmission capacity in the 1980s with heavy investment outlay on hydropower, gas and steam turbines. Six thermal and three hydropower stations and seventy-three generating units with a total installed capacity of approximately 6098 megawatts (MW) were functional. The thermal power stations are: Afam with a generating capacity of 100 MW, Delta - 820 MW, Egbin - 1320 MW, Sapele - (i) and (ii) 1020 MW and Ijora - 66 MW, while the hydro power stations are Jebba 578 MW, Kainji 760 MW and Shiroro - 600 MW. Generated electric power is transmitted via numerous transformers, reactors, circuit breakers and transmission lines spread all over the country. With the installed capacity, electricity generation by the national grid rose progressively from 1,547.0 million kilowatt hours (MKH) to 4,106.2 mkh in 1976 and 7,140.4 mkh in 1980. By 1985, electricity generation had increased to 10,221.1 mkh and later to 13,462.9 mkh in 1990 before attaining an all time high of 15,531.0 mkh in 1994. In the same vein, total electricity consumption maintained an upward trend from 1970 to 1994. For instance, total electricity consumption rose from 1,272.8 mkh in 1970 to 3,239.3 mkh in 1976, 6,285.0 mkh in 1985 and finally 10,238.2 mkh in 1994 (Table 5). In terms of share of electricity consumption, the shares of both industrial and commercial consumers declined progressively from a high of 65.5 per cent of total in 1972 to 41.5 per cent in 1994 while residential component, on the other hand increased from 34.5 per cent in 1972 to 58.5 per cent in 1994. The Authority is faced with a situation whereby the power generation capacity is poorly under-utilised, as approximately 50 per cent of the total installed capacity of the stations is being utilised. Furthermore, the percentage of total electricity generated that is consumed has been fluctuating over the years, with a deterioration in transmission and distribution.

(ii) Gas

Utilization of gas and gas product is very low in Nigeria in spite of its abundance and relatively high production level. While gas production increased from 8,039 million cubic metres (mill.m³) in 1970 to 24,551 mill.m³, 28,163 mill.m³ and 32,793 mill.m³ in 1980, 1990 and 1994 respectively (Table 6). Only 1.0, 6.7, 22.5 and 20.1 per cent of these levels of production were utilized, while between 77.5 and 99.0 per cent of gas produced were flared in the review period. This is clearly an indication of the nation's low level of economic development. It is only recently that the Federal Government gave a directive to the petroleum/gas producing companies to re-inject some percentages of the unutilized gas to reduce unnecessary waste of this natural resource.

(g) Water Supply

Substantial funds have been channelled into the development of water resources. Total volume of available treated water as at the end of 1995 was 6,668,000 million cubic metres. Of this, domestic use accounted for 15.0 per cent while industrial use and irrigation had respective shares of 34 and 51 per cent. The Federal Ministry of Water Resources and State Water Boards have stepped up efforts at provision of water while external support agencies (ESAs), supplemented the efforts through various grants and aids. Although budgetary allocations to water resources has been on the increase since the past five years, many communities are yet to have access to treated water. Besides, there have been persistent shortage of potable water even in major cities where facilities have been installed.

2.2 The Quality of the Infrastructure

When it come to the discussion of quality of infrastructure in Nigeria, the picture seems to be unacceptable. Until recently, our roads were reasonably good, particularly those roads that link major cities and interstate connections. Feeder roads are of lesser quality as many of them are not tarred, while most are seasonal - that is, some of them are not motorable during the rainy season and some are mere expansion of foot paths.

In the colonial days, the railway system was intended to simplify collection of agricultural products from production origins to the centres where they were prepared for export. The development has been stagnant. The rail lines have not been extended to many commercial cities or mineral deposit locations where they can be cost effective.

Thus, the running of the rail lines had persistently been done on deficit, thereby constituting a drain on the nation's purse.

The quality of services rendered by most Nigerian Airports and the efficiency of delivery is poor compared with other airports around the world. It is characterised by frequent flight delays and cancellation and ironically plying of non-economic routes as well as gross under-utilisation of most of the airports and airstrips.

Frequent disruption in the supply of electricity has become so common compelling most enterprises to install standby generating plants thereby increasing production costs. The situation is worse for small scale enterprises which cannot afford to install generators. They are therefore left at the mercy of NEPA; when power goes off the production process is suspended until it comes back. This has brought untold hardship in industrial sub-groups that use electricity as input, such as grinding mills, welding firms etc. In many cases the voltage variation from NEPA often cause serious damage to equipments and prolonged disruptions in the production run of those enterprises.

Telecommunication and postal services have tended to bring mixed results. Telephone services, where they exist at all are always poor and the cost is exorbitant. Telex and fax services are also quite expensive. It is, however, more correct to argue that the problem in the area of tele-communication is generally more of availability and cost than that of efficiency. However, postal services are grossly inefficient and risky. Letters spend a long time in transit at times up to one month or two for interstate deliveries. In some case, the contents of the letter may be vandalised. The inefficiency of the official postal system has encouraged the emergency of courier services which are fast but costly. A minimum of N500 per mail and N750 are charged for state and inter-state courier services compared with the N5 and N10 for NIPOST services.

With the exception of few large urban centres and state capitals, a substantial volume of domestic water supply are untreated from boreholes or dams. There is hardly any household or any enterprise that does not need water at one stage of its operation or the other. The consumption of untreated water by households and companies pose very serious health hazards and account for the prevalence of water borne diseases in almost all states of the federation.

PART III ISSUES AND OPTIONS

The need for a cost effective and an efficient infrastructure as a pre-requisite for economic development cannot be over-emphasized. Suffice it to say that the state of the infrastructural facilities in the Nigerian economy as reviewed in the preceding section leaves much to be desired. While electric power consumption is permanently below generation level thereby suggesting that all is well, the fact of the case is that industrial consumption is on the decline which means that the country is economically under-developed. The same is true for communication and water supply systems. The problem is compounded by the lack of adequate maintenance of the structures resulting in their deplorable condition. According to the 1988 World Bank study of Nigerian manufacturing industries, 92% of the 179 firms surveyed owned electricity generators in the face of chronically unreliable public services, many had also acquired radio equipment for communications and dug boreholes to assure their own water supply. The net effect of privately providing some of these unreliable infrastructure is the burden of extra costs, which as observed by the survey, ranged from 10 per cent of the budget for machinery and equipment of big companies to 25 per cent for small scale industries.

The poor state of infrastructure calls for a quick revitalization of the existing facilities as well as their extension to a wider segment of the economy. However, provision and maintenance of these facilities through official sources is bedeviled with a lot of problems such as escalating costs in the face of spiraling inflation, dwindling resources arising from declining official foreign exchange receipts and hence total government revenue. Since availability and maintenance of infrastructure cannot be compromised for effective economic development, the government is now faced with a number of options to choose from in order to sustain its provision. **These include**, choice of funding and management between the public and private sectors and/or a combination of both. The options available then are (i) continued provision and maintenance from budgetary allocations and subventions; (ii) commercialisation through charging of market determined prices so as to cover cost of provision; and/or (iii) privatization of these facilities. Other lines of action open to government include, contract management and leasing of the day-to-day running and maintenance of the infrastructure. The various options are analysed in details as follows:

(i) Sustainability of current public sector Provision and Management of Infrastructure

As noted above, provision and management of infrastructure has traditionally been undertaken by government or public sector agencies in Nigeria right from colonial days. This was highly necessary in order to open up the country to commerce and also to unite the country together economically. Besides, the cost of providing these facilities were so enormous that private sector resources could not cope while required skilled manpower to manage the facilities was also absent. However, with increasing scope of economic activities and development of manpower resources, the private sector is now in a position to participate in the provision of infrastructure if adequate incentives are given. Apart from this, government resources had been overstretched due to increasing population in the face of low revenue and high inflation. At the same time, official provision had been found to be less efficient in the utilization of resources. For these reasons and for the fact that the market force is making government to hands-off purely economic activities for which it is less endowed, continued government provision of infrastructure is not sustainable. Hence, whether now or in the near future, private sector will have to be invited to provide or maintain some of the infrastructural facilities.

(ii) Commercialisation of infrastructure

The commercialisation option is aimed at recovering costs whether total cost of operation or some parts thereof. As a result, market determined prices or those close to market rates will be charged for goods and services that were hitherto rendered free by public agencies. Where commercialisation is full, this means that further production of facilities/services will no longer attract government subvention, grants, loans or annual budgetary allocations. Thus, the full cost of the provision of such facilities will be borne by the consumers. The other variant of this is where part of the cost is still borne by the government. The choice of the type of commercialization to be embarked upon has to be made, by considering a number of factors, chief amongst which are, strategic nature of the commodity and national security and interest.

Commercialisation of public enterprises has commenced in Nigeria with the introduction of the Structural Adjustment Programme (SAP) in 1986 whereby public sector parastatals have been slated for either full or partial commercialisation. It has also been tried in the management of the Federal highways whereby the collection of tolls was done by government prior to the invitation of the private sector firms in March 1996. The principal feature of commercialisation programme is that ownership and management

still rest with the government or its appointed agents. The only snag here is that unscrupulous officials may 'collude' with consumers by accepting less than approved rates as well as indulge in revenue diversion.

(iii) Privatisation of Infrastructure

This type of arrangement involves the express participation of private sector interests in the provision and management of infrastructural facilities. In other words, it involves the use of private funds as well as expertise in the provision of facilities. This choice pre-supposes that such facilities will now be provided purely on economic grounds. The distinctive feature of privatisation is that it eliminates waste and reduces government expenditure to the tune of budgetary allocation and subvention that would have been utilized were the facilities not privatised while at the same time making resources available for other areas needing urgent attention such as social infrastructure (education and health care). Like commercialisation, privatisation could be full or partial depending on how strategic the facility concerned is to national security and interest. In fact, the partial privatisation option is being tried in the management of the Federal highways with effect from March 1996. This is in the form of Maintain - Operate and Transfer (MOT) i.e. the day-to-day management, maintenance and rehabilitation of selected Federal highways were ceded to some private sector firms to run and pay agreed sum of revenue to the Federal Government at regular intervals. So far, the option has proved to be worthwhile. This type of option could be extended to the nation's sea and airports and even the rail tracks since ownership is still vested in the Federal Government. Other strands of privatisation include the outright sale of facilities to the private sector. The good candidates for this type of privatisation are electric power distribution, water supply, road maintenance and communication facilities.

PART IV SUMMARY AND CONCLUSION

The paper examined the role of infrastructure in economic development and saw it as an umbrella term for many facilities (such as transport, communication, electric power and water supply). These are sometimes generally referred to as social overhead capital. The relationship between infrastructure and economic growth is a positive and direct one. The paper opined that investment in infrastructure should not be seen as an end on its own to generate sustained increases in economic growth but emphasised the

fact that demand for infrastructure services is itself sensitive to economic growth. In Nigeria, services associated with the use of infrastructure account for an average of 4.0 per cent of the GDP which is however, less than the average 6.63 per cent for the lower income countries. Effective delivery of infrastructure services helps the poor and also contributes to environmental sustainability. Access to at least minimal infrastructure services is one of the criteria for defining welfare while the poor can be identified as those who are unable to consume basic treated water or mobility beyond their immediate settlement. Access to infrastructure services is important for ensuring that growth is consistent with poverty reduction. Also infrastructure services is linked with environment particularly the efforts which communities make to modify their physical surroundings or habitat in order to improve their comfort, productivity and protection from undesirable elements.

Evidence from the paper showed that the infrastructural facilities and structures available in Nigeria are predominantly public goods in terms of ownership and investment. The nation has total road network of 171,328 kilometres with Federal and State highways at 32,100 km and 30,548 km, respectively. Seaport facilities are also well developed at Lagos (Apapa & Tincan Island), Calabar, Port Harcourt, Sapele and Warri. The country has four international airports at Lagos, Kano, Abuja and Port Harcourt with eight other airports and 6 airstrips located elsewhere across the country. The rail tracks constructed increased from 2,048 km in 1955 to 3,505 at end-1995. In respect of communications, the number of telephone sets in 1995 were 4,056 while telex sets stood at 7,280. Postal facilities stood at 3,623 with 788 post offices, 148 sub-post offices and 2,687 postal agencies. In terms of electric power, the country has six thermal and three hydro-power stations and 73 generating units with a total installed capacity of 6,098 megawatts. The total volume of available water at end-1995 was 6,668,000 million cubic metres with respective shares of 15.0, 34.0 and 51.0 for domestic, industrial and irrigation use.

However, in spite of the efforts to put all the structures and facilities in place, the quality of infrastructure services remain dismal. The roads are not motorable for the major part of the year as a result of inadequate maintenance. The seaports are under-utilised, the rail system does not run efficiently for lack of locomotives while the aircraft fleet is not adequate to the extent that the airports are under-utilised. Telephone services are poor and restricted to few urban areas while postal services are inefficient. Electric power disruption and low voltage is common place and most enterprises have resorted to installing their own power generating sets at additional production costs. Accessibility

to water supply is restricted to few urban areas while water supply is largely untreated and this poses health hazards.

The paper also assessed the need for a cost effective infrastructure delivery system while calling for revitalisation of the existing facilities and their extension to a wider segment of the economy. It opined that continuous provision of such services by the Government is bedeviled by the dwindling fiscal budget revenue posture as well as inefficiency of the monopolies created to manage them. The Government is therefore, faced with the question of ability to manage them from its lean purse, or commercialise them to be able to recover costs. The other option is for government to divest its interest in some of the facilities through privatisation and thus allow the private sector to invest and introduce competition in the provision of the services.

The conclusion that can be drawn is that the stock of infrastructural facilities predominantly owned by Government, is inadequate and accessibility to some of the key ones is restricted to few urban areas. The provisions of some of the services are inefficient (telephone and postal services) and erratic, (e.g. electric power and treated water) to the extent that individuals arrange their private radio phone and courier services; buy power generating sets and dig boreholes for their uses. In terms of impact on economic activities, private provisioning of infrastructural services increases costs of production and tends to fuel inflationary pressures. The options available to government are to: firstly commercialise the services with a view to recovering the cost of provision and secondly, government should strive to privatise some of the services to allow competition and thus make room for a more efficient delivery of infrastructure services.

Table 1
Value-Added of Infrastructure Service by Country Group
(Percentage of GDP)

Sector	Low income Countries	Middle-income Countries	High-Income Countries
Transport Storage & Communications	5.34	6.78	9.46
Gas, Electricity and Water	1.29	2.24	1.87
Infrastructure Sub-total	6.63	9.02	11.33

Note: Market prices at factor cost
 Data for 1990 - latest available

Source: World Bank National Accounts Data

Table 2
Contribution of Economic Infrastructure to GDP in Nigeria 1991 - 1995 (Per cent)

Sector	1991	1992	1993	1994	1995
Utilities	0.54	0.57	0.58	0.58	0.59
Transport	3.12	3.16	3.22	3.21	3.18
Communication	0.25	0.28	0.28	0.28	0.28
Total	3.91	4.01	4.08	4.07	4.05

Sources: (i) Federal Office of Statistics (FOS) Lagos
(ii) National Planning Commission

Table 3
OCEAN SHIPMENT

Year	From Abroad		To Abroad		Non-Oil Shipping (000 tonnes)		Total
	No. of Ships Entered	Net Registered Tonnage (m)	No. of Ships Cleared	Net Registered Tonnage (m)	Imports	Exports	
1970	2,304	7.7	2,297	6.8	4,224.0	53,216.0	57,440.0
1971	2,481	7.1	2,489	7.1	5,749.0	72,573.0	78,322.0
1972	2,473	7.3	2,541	7.5	4,348.0	81,416.0	85,764.0
1973	-	-	-	-	-	-	-
1974	3,613	32.7	2,277	29.0	5,110.0	2,397.0	7,507.0
1975	3,850	-	2,445	-	6,545.0	1,977.0	8,522.0
1976	2,483	-	2,175	-	7,954.0	894.0	8,848.0
1977	4,957	-	4,699	-	11,323.0	684.0	12,007.0
1978	6,612	70.5	6,602	74.2	30,479.0	2,255.0	32,734.0
1979	5,657	85.1	5,690	85.1	13,878.0	2,152.0	16,030.0
1980	3,597	15.4	3,663	15.6	17,240.2	1,227.5	18,457.7
1981	3,990	18.0	4,053	18.3	19,604.7	1,546.0	21,150.7
1982	3,370	14.2	3,485	15.5	13,337.4	503.9	13,841.3
1983	3,664	48.9	3,670	49.2	14,945.7	458.9	15,404.6
1984	2,568	57.2	2,622	47.8	11,234.8	478.6	11,713.4
1985	2,739	47.4	2,734	48.3	12,824.9	636.0	13,460.9
1986	1,949	26.9	1,938	25.9	8,527.5	425.1	8,952.6
1987	1,534	8.4	1,521	8.6	7,842.0	659.0	8,501.0
1988	1,231	5.5	1,270	5.7	4,862.5	1,007.0	5,869.5
1989	2,483	10.2	2,467	10.3	6,749.0	1,923.4	8,672.4
1990	2,880	11.6	2,843	11.6	6,041.5	3,010.9	9,052.4
1991	2,365	11.3	3,092	12.0	7,459.7	2,779.2	10,238.9
1992	1,813	8.3	1,757	8.1	5,584.0	1,175.0	6,759.0
1993							
1st Quarter	895	4.2	891	4.2	3,371.0	542.0	3,913.0
2nd Quarter	816	4.2	801	4.3	3,119.0	551.0	3,670.0
3rd Quarter	765	4.1	760	3.5	2,711.0	424.0	3,135.0
4th Quarter	300	2.3	378	2.3	1,741.3	581.9	2,323.0
1994 1/							
1st Quarter	422	2.5	438	2.6	2,363.2	337.1	2,700.3
2nd Quarter	663	3.1	648	3.2	2,311.0	333.0	2,644.0
3rd Quarter	536	2.4	541	2.3	1,848.0	409.0	2,257.0
4th Quarter	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

1/ Provisional

n.a. not available

Source: Nigerian Ports PLC, Lagos.

Federal Office of Statistics, (F.O.S.) Trade Division, Lagos.

**TABLE 4
COMMUNICATION STATISTICS**

Services	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
1. TELEGRAPH											
No. of Messages											
(a) International ('000)		80.5	96.8	180,530.0	37.0	162.0	487.0	423.7	839.7	125.9	143.4
(b) Domestic ('000)		1,359.4	1,561.8	392.0	1,688.0	2,005.0	2,083.3	3,746.8	441.9	37.0	22.2
No. of words											
(a) International ('000)		-	-	-	-	-	-	-	-	-	-
(b) Domestic ('000)		-	-	-	-	-	-	-	-	-	-
2. TELEPHONE											
(a) International											
(i) No. of Paid Minutes ('000)											
(ii) No. of Call-units ('000)		-	-	186.0	286.0	301.0	314.7	392.7	144.4	1,915.3	2,622.2
(b) Domestic											
(i) Trunk Subscriber dial-call units ('million)		-	-	-	-	-	-	-	-	-	-
(ii) Trunk Operator assisted call-units ('million)		4.2	4.1	4.2	4.0	4.0	-	-	-	-	-
3. TELEX											
(a) International											
(i) No. of call units ('000)	-	-	-	-	-	392.2	587.1	535.8	798.5	787.5	-
(ii) No. of words-paid per minute ('000)	-	-	-	-	-	-	-	-	-	-	-
(b) Domestic											
(i) No. of Calls Units ('000)	-	-	-	-	-	17.2	24.7	-	-	-	-
4. POSTAL FACILITIES											
Postal Agencies	1,393.0	1,434.0	1,438.0	1,438.0	1,457.0	1,486.0	1,787.0	2,051.0	2,151.0	2,378.0	2,506.0
Sub Post Offices	63.0	65.0	71.0	71.0	70.0	75.0	68.0	74.0	75.0	88.0	105.0
Post Offices											
Mobile Post Offices	220.0	222.0	227.0	227.0	237.0	242.0	285.0	299.0	312.0	324.0	356.0
Total	20.0	20.0	20.0	21.0	32.0	27.0	31.0	34.0	34.0	34.0	-
5. TELECOMMUNICATION FACILITIES											
Facilities											
Telephone Sets		-	-	-	-	-	-	-	169.0	191.0	202.0
Telex Sets											
Private Wires		-	-	-	-	-	-	-	-	-	-
Telephone		9.0	9.0	31.0	29.0	28.0	30.0	32.0	32.0	32.0	32.0
Telegraph		105.0	117.0	155.0	129.0	133.0	135.0	99.0	99.0	99.0	109.0
Music		-	-	-	-	-	-	-	-	-	-
Leased Circuits		26.0	30.0	41.0	48.0	52.0	52.0	92.0	92.0	92.0	92.0

**TABLE 4 (CONTD.)
COMMUNICATION STATISTICS**

Services	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 1/
1. TELEGRAPH												
No. of Messages												
(a) International ('000)	1.3	0.8	4.9	39.1	-	15.1	765.7	387.4	10.9	5.7	3.8	3.1
(b) Domestic ('000)	16.9	3,198.0	3,591.8			377.1	280.5	240.0	47.7	41.2	99.0	17.1
No. of words												
(a) International ('000)				1,492.0	1,821.0	558.8	355.4	432.1	468.4	98,978.4	101,083.4	108.9
(b) Domestic ('000)				5,841.0	7,527.0	4,537.5	491,264.9	540,926.9	1,569.4	1,538.0	646.9	560.7
2. TELEPHONE												
(a) International												
(i) No. of Paid Minutes ('000)				23,872.0	24,486.6	14,077.0	19,936.1	38,202.8	15,506.5	-	40,412.1	44,279.6
(ii) No. of Call-units ('000)	2,622.4	2,058.7	3,181.0	2,554.1	n.a.	1,865.7	3,014.5	4,349.4	2,799.1	182.9	236.6	435.0
(b) Domestic												
(i) Trunk Subscriber dial-call-units ('million)				903.3	880.3	942.7	1,595.3	1,285.4	1,013.6	1,296.2	1,796.3	1,823.9
(ii) Trunk Operator assisted call-units ('million)				3.6	9.0	12.2	2.7	1.7	2.4	-	2.2	453.5
3. TELEX												
(a) International												
(i) No. of call units ('000)	8.4	610.5	735.2	779.6	-	360.1	1,016.0	1,079.1	153.0	45.0	22.1	11.8
(ii) No. of words-paid per minute ('000)				3,962.0	4,830.0	1,487.2	4,430.5	1,333.1	702.8	419.6	120.9	50.9
(b) Domestic												
(i) No. of Calls units ('000)				34,445.0	73,045.0	45,494.4	4,929.5	38,874.9	31,833.0	26,647.6	10,100.0	65,150.0
4. POSTAL FACILITIES												
Postal Agencies	2,618.0	2,671.0	2,701.0	2,733.0	2,857.0	2,736.0	2,744.0	2,757.0	2,774.0	2,665.0	2,670.0	2,687.0
Sub Post Offices	115.0	127.0	133.0	145.0	155.0	156.0	169.0	179.0	166.0	154.0	150.0	148.0
Post Offices	396.0	434.0	462.0	486.0	538.0	552.0	555.0	572.0	606.0	761.0	782.0	788.0
Mobile Post Offices	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	1.0	-	-	-
Total	3,163.0	3,266.0	3,330.0	3,398.0	3,584.0	3,478.0	3,502.0	3,542.0	3,547.0	3,580.0	3,602.0	3,623.0
5. TELECOMMUNICATION FACILITIES												
Facilities												
Telephone Sets	218.0	244.0	85.0	265.0	325,030.0	317,916.0	483,496.0	492,204.0	497,975.0	1,000.0	376,515.0	405,586.0
Telex Sets					12,729.0	5,898.0	7,402.0	9,282.0	7,310.0	6,935.0	7,280.0	-
Private Wires												
Telephone	32.0	35.0	240.0	107.0	-	-	148.0	-	-	-	-	-
Telegraph	109.0	109.0	62.0	49.0	-	-	-	-	-	-	-	-
Music												
Leased Circuits	92.0	92.0	56.0	58.0	-	52.0	98.0	63.0	-	-	-	-

1/ Provisional

Source: NITEL and NIPOST Lagos.

TABLE 5
ELECTRICITY GENERATION AND CONSUMPTION
(MILLION KILOWATT HOURS)

Year	Generation			Consumption				% of Total	Total
	Installed Capacity (Mega watt)	Total Generation	Industrial 2/	% of Total	Commercial & Street lighting	% of Total	Residential		
1970	804.7	1,547.0	801.0	62.9	-	-	471.8	37.1	1,272.8
1971	804.7	1,886.3	1,006.4	63.5	-	-	579.6	36.5	1,586.0
1972	786.7	2,237.2	1,210.5	65.5	-	-	638.4	34.5	1,848.9
1973	670.6	2,625.2	1,280.1	62.8	-	-	758.3	37.2	2,038.4
1974	721.0	2,287.2	1,429.2	61.3	-	-	901.9	38.7	2,331.1
1975	926.2	3,463.5	1,755.6	62.9	-	-	1,036.0	37.1	2,791.6
1976	1,125.2	4,106.2	1,879.6	58.0	-	-	1,359.7	42.0	3,239.3
1977	1,114.2	4,712.6	2,216.5	58.1	-	-	1,600.4	41.9	3,816.9
1978	1,793.7	4,579.1	1,381.7	31.3	819.1	18.5	2,218.3	50.2	4,419.1
1979	2,230.6	6,225.5	1,404.2	34.8	682.5	16.9	1,943.6	48.2	4,030.3
1980	2,230.5	7,140.4	1,749.0	37.2	824.5	17.5	2,129.6	45.3	4,703.1
1981	2,430.0	7,776.4	33.0	0.9	747.1	21.3	2,723.6	48.4	3,503.7
1982	2,902.1	8,531.7	2,294.7	38.4	657.0	11.6	3,018.2	50.6	5,969.9
1983	2,836.8	8,713.0	2,228.9	36.5	738.5	12.1	3,135.7	51.4	6,103.1
1984	3,178.0	8,983.6	1,902.3	34.7	715.3	13.1	2,860.9	52.2	5,478.5
1985	3,695.5	10,221.1	2,275.9	36.2	750.2	11.9	3,258.9	51.9	6,285.0
1986	4,016.0	10,765.6	2,547.6	33.3	742.4	10.1	4,174.7	56.6	7,374.7
1987	4,548.0	11,265.4	2,576.5	34.5	789.8	10.6	4,105.1	54.9	7,471.4
1988	4,548.0	11,654.1	2,549.6	34.1	1,039.1	13.9	3,888.0	52.0	7,476.7
1989	4,548.0	12,813.1	2,258.8	26.4	1,710.7	20.0	4,586.8	53.6	8,556.3
1990	4,548.0	13,462.9	2,015.6	25.6	1,906.3	24.2	3,948.6	50.2	7,870.5
1991	4,548.0	14,166.6	2,042.3	26.8	2,225.9	26.8	4,023.8	48.5	8,292.0
1992	4,580.0	14,833.8	21,177.0	100.4	2,181.6	100.2	4,340.3	199.3	8,699.0
1993 1/									
1st Quarter	4,548.6	3,877.1	513.9	21.4	732.4	30.5	1,153.5	48.1	2,399.8
2nd Quarter	-	3,466.2	538.9	23.3	668.2	28.9	1,104.1	47.8	2,311.2
3rd Quarter	-	3,579.7	496.8	19.9	569.6	26.4	1,345.8	53.7	2,502.2
4th Quarter	-	3,581.6	517.3	18.6	654.2	23.5	1,613.6	57.9	2,785.1
1994 3/									
1st Quarter	4,548.6	4,089.0	516.8	19.9	687.2	26.5	1,388.0	53.6	2,592.0
2nd Quarter	-	3,619.0	583.0	23.2	677.4	27.0	1,252.7	49.8	2,513.1
3rd Quarter	-	3,896.5	392.4	15.3	671.8	26.3	1,492.9	58.4	2,557.1
4th Quarter	-	3,926.5	695.4	15.3	672.9	26.2	1,507.7	58.5	2,576.0

1/ Figures are Revised

2/ Industrial Figures for 1970 - 1977 include Commercial Consumption Figures.

3/ Estimates

Source: National Electric Power Authority (N.E.P.A.)

TABLE 6
GAS PRODUCTION AND UTILIZATION IN NIGERIA (1970-1994)
(MILLION CUBIC METRES)

Year	Production	Utilization	Flaring
1970	8,039	72	7,957
1971	12,975	185	12,790
1972	17,122	274	16,848
1973	21,882	395	21,487
1974	27,170	394	26,776
1975	18,656	323	18,333
1976	21,276	659	20,617
1977	21,924	972	20,952
1978	21,306	1,866	19,440
1979	27,619	1,546	26,073
1980	24,551	1,647	22,904
1981	17,113	2,951	14,162
1982	15,382	3,442	11,940
1983	15,192	3,244	11,948
1984	16,255	3,438	12,817
1985	18,569	3,723	14,846
1986	18,739	4,822	13,917
1987	17,085	4,794	12,291
1988	20,253	5,516	14,737
1989	25,053	6,323	18,730
1990	28,163	6,343	21,820
1991	31,587	7,000	24,588
1992	32,465	7,058	25,406
1993 1/ 1994 2/	33,445	7,536	25,908
1st Quarter	8,455	1,958	6,920
2nd Quarter	8,051	1,394	6,657
3rd Quarter	8,030	1,603	6,427
4th Quarter	8,257	1,622	6,635

1/ Revised

2/ Estimate

Source: Nigerian National Petroleum Corporation (NNPC).

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