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COSTLY NEGLECT: TECHNOLOGY, INDUSTRIALIZATION AND THE CRISIS OF DEVELOPMENT IN NIGERIA

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Abstract

Nigeria has struggled to promote development in all facets of life in the five decades of its independence. The efforts have generally yielded very modest success and the reality is that in the early 21st century Nigeria continues to face what some scholars have described as the "crisis of development". This article examines the contribution of the development of technology and industrialization to this development crisis. It discusses the pattern of the development of technology and industrialization in the country in the colonial period and the influence on industrial policy after independence. The nature and changes which took place in technological and industrial development in Nigeria since 1960 as well as the factors responsible for the low level of development are also explored. We contend that the low level of technological and industrial development constituted a serious blight to Nigeria's development efforts up to 2010. The article argues that contrary to some perspectives, specialization has its limits even in the contemporary milieu of intense globalization and industrialization is central to development of all countries. Nigeria's ability to articulate effective industrial policy and commitment to the policy to achieve economic transformation are therefore important to the country's development in the future.

Key Words: Technology, Industrialization, Economy, Development, Nigeria.

Introduction

Before the advent of European colonial rule in Nigeria, some level of technological and industrial development was achieved by a number of Nigerian communities. This was reflected mainly in the manufacture of tools and implements used for different purposes as well as the production of artistic material (Falola, 2008:18-20; Osuntokun, 2000:99-107). Indeed, in contemporary times, the relevance of aspects of traditional technology to modern living has been emphasized (*Nigerian Tribune* 2010:48). However, in the modern

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sense of the sophistication of technology and industrialization, respectively defined as "the scientific study and use of applied sciences, the application of this to practical tasks of industry"; and "the process of producing goods, especially in factories", it was during the colonial period that the process expanded (Davies, 1988: 144). Even then, only scanty attention was paid to technological and industrial development by the colonial authorities in Nigeria and the result was that at independence Nigeria's technological and industrial levels were low compared to the middle-income and developed countries of the world (Onimode, 2000:75-76). However, Nigeria's level of technological and industrial development was similar to what obtained in many other colonial territories. This was because the colonial powers were generally not committed to high level of technological development of their respective colonies (Ake, 1981:58-59). In the immediate post-independence period, therefore, a major challenge that countries like Nigeria had to face was how to promote rapid technological and industrial development (Adamolekun, 2003:73-74).

In this article, we begin by examining the nature and level of technological and industrial development in Nigeria during the colonial period. This analysis provides the background for assessing the progress made in the half a century since independence.

Level of Technological and Industrial Development at Independence

At independence, the level of development of technology and industrialization in Nigeria was very low. This was also the case in other areas such as education and health. During the nearly a century of colonial rule in Nigeria, the British paid very little attention to the development of technology and industrialization and the result was the low level of industrial and technological development in 1960. This attitude was in line with British colonial policy. The philosophy of European colonialism in the 19th and 20th centuries was that Africa should be kept as a source of cheap raw materials to feed the industries in Europe and to serve as a market for its finished products (Oliver and Atmore, 1996:124-130). Embarking on intense technological and industrial development was therefore tantamount to destroying the basis of colonialism itself. The fact that the British colonial authorities strongly encouraged the cultivation of cash crops easily explains this.

The development of technology and industrialization requires conscious effort, a reasonable amount of resources and a clear aim which is to promote scientific study and research, the results of which are used to make machines and other inputs for mass production of goods and to ease the laboriousness with which services are carried out. There was a tremendous advancement in this area in Europe in the second half of the 18th century during the 19th century in what has been described as the "industrial revolution". By the early 20th century, Britain, which blazed the trail in the industrial revolution, had recorded a great leap in its economic development, and the resources from the colonies and the markets they provided played a great role in this (Goff, 1998:14). Britain did not want to disrupt this condition and her desire to maintain the status quo meant little or no attention to the development of technology and industrialization in the colonies which included Nigeria.

However, some attention was paid to scientific research and industrialization during the two world wars when it was difficult to import manufactured products from

Europe (Osuntokun, 1979:51-52). After the end of World War II in 1945, the British colonial authorities seriously considered the possibility of establishing an office to co-ordinate the development of commerce and industries in Nigeria. This led to the establishment of the Department of Commerce and Industries in 1946. This office had as one of its major assignments the conduct of research on a small scale and the promotion of industrial development (Kilby, 1969:182-183). The activities of the Department enhanced the development of technology and industrialization at its inchoate stage in the 1940s.

Further attention was paid to the development of technology and industrialization in the 1950s. In September 1952, a World Bank mission came to Nigeria on the invitation of the British government to conduct a survey on the state of technology in Nigeria and ways of improving it. The mission submitted its report in 1954. It observed that research efforts had not been systematic and recommended that an institute of applied technical research be established (Ekundare, 1973:296). Following this recommendation, the British colonial authorities provided the sum of £260,000 which was used to establish the Institute of Applied Technical Research in 1956. This Institute, which later became the Federal Institute of Industrial Research, was responsible for coordinating research into new methods of production throughout Nigeria from when it was established. It continued to carry out basically the same function under its new name after independence. It carried out research in many areas, but the most prominent ones were the use of wide fibres for the making of sack, the use of local dyestuff for textile manufacture and the mechanization of the production of gari (Kilby, 1969:185-191). Some of the research efforts had actually commenced before the establishment of the Institute of Applied Technical Research, but it continued from where they were inherited and struggled to ensure that they were completed so that the results could be put to good use.

The application of the modest achievements recorded by the Institute of Applied Technical Research and the few breakthroughs made before its establishment, which included the results of the research efforts of the West Africa Institute of Oil-Palm Research, constituted the level of technological development of Nigeria at independence (Ekundare, 1973:295-296). There was, of course, local technology which continued to feature prominently in the production techniques of Nigerians. However, in most instances this was rudimentary. In fact, the research efforts of the post-World War II period were basically aimed at improving on the indigenous technology which was regarded as laborious and unsophisticated.

A similar trend was recorded in the area of industrial development. The post World War II attention to the production of some goods in Nigeria, especially those items in which raw materials were available, resulted in the establishment of many new factories in the 1950s. This received a boost from 1955 onwards following the introduction of the Lyttleton Constitution in 1954, which transferred the responsibility for industrial development to the regional governments. The Nigerian leaders who assumed responsibility for administering the regions saw industrial development as a way of stimulating economic development. They therefore put in place policies and incentives to encourage investors. Some of these included the provision of finance in form of loans to assist private entrepreneurs. This was important since lack of capital was one of the major problems faced by industrialists, especially the indigenous ones, during the period. It was

in accordance with this objective that the Federal Government established the Federal Loans Board in 1956. In addition to this, the government at the center established the Investment Company of Nigeria in 1959 with the assistance of the Commonwealth Development Finance Company. The main objective of the Investment Company was to provide finance and technical assistance to companies engaged in manufacturing, agriculture and mineral exploitation (Arikawe, 1987:19).

In addition to the provision of assistance to entrepreneurs, the government at various levels was involved in direct investments in industrial production as well. In 1959, the government of Eastern Region formed the Industrial and Agricultural Company to promote manufacturing and agricultural production. The Northern Nigeria government established the Northern Nigeria Investments Limited which carried out a similar function with the Eastern Region's Industrial and Agricultural Company. Long before this time the government of Western Nigeria had established the Western Region Development Corporation which had been involved in industrial manufacture since 1954 (Arikawe, 1987:110). Apart from this, the Western Region embarked on the development of infrastructure on a large scale which was aimed at providing a boost to industrial production. All the efforts greatly stimulated industrial development in Nigeria between 1954 and 1960. Indeed, it can be said that the little autonomy which was provided by the 1954 Constitution was exploited by Nigerian leaders to give a leap to the country's industrial development (Onyemelukwe, 1982:176).

At independence in 1960, Nigeria had a total of 389 industrial establishments (Onyemelukwe, 1982:175-177). Many of these were engaged in the production of soap, cement, tobacco, textile and brewing. At this time, the country's population was estimated at about 50 million. Products from these factories were grossly inadequate to meet the needs of the teeming population. The result was that Nigeria continued to import much of the manufactured products it needed. This was the state of industrialization in Nigeria at independence. Taken along with the state of the development of technology described earlier, it can be concluded that the level of industrial and technological development of Nigeria at independence was very low.

The Development Technology and Industrialization since 1960

In the first half of the 1960s, Nigeria continued to build on the foundations of the two previous decades in the areas of industrialization and technological development. The Federal Institute of Industrial Research continued to bear the responsibility for carrying out studies into viable industrial activities and for assisting new manufacturing establishments by offering guidance on effective use of raw materials and machines. Thus, the study into the production of jute bags and mattress filling from coconut fiber continued after independence. The same was true of the research into the industrial production of *gari* and pulp for papermaking. The latter culminated in the establishment of a paper m ill at Jebba in 1963 (Kilby, 1969:190). However, following the political crisis which broke out across the country in 1966 and the civil war which began in the second half of 1967, industrial research received very little attention until 1970 (Aworawo 2002:217-218).

The process of industrialization followed a similar pattern. There was rapid progress from 1960 to 1966, but things slowed down from 1967 and picked up again from 1970. For instance, while there were 687 manufacturing establishments in Nigeria in 1964, which increased to 776 in 1965, the number fell to 625 in 1968 as the civil war raged. However, after the ware ended in 1970, the number rose to 703 at the end of that year and jumped to 1,054 in 1972 (Arikawe, 1987:112). Thus, the Nigerian Civil War, like most wars, negatively affected the development of technology and industrialization in Nigeria.

In 1970, the Second National Development Plan was formulated to guide the development of the country for five years. Emphasis was placed on industrial and technological development in the Plan. The same was true of the Third National Development Plan (1975 to 1980) and the one that followed from 1980 to 1985. The Third and Fourth Plans specifically committed the government to the establishment and expansion of a Research Products Development Company, an Institute of Industrial Research and industrial development centers. Accordingly, the government established the Industrial Research Council of Nigeria in 1971 which was affiliated to the Federal Ministry of Industries. The agency was established to co-ordinate industrial research activities in Nigeria and to organize for the application of the results to practical industrial activities (Njoku, 2001:227). In addition, a National Council for Science and Technology had been established in 1970, which was replaced by the National Science and Technology Development Agency (NSTDA) in 1977. This Agency became a full ministry, the Ministry of Science and Technology in 1979. This ministry became the apex body for the coordination of research and technological development all over the country (Olaoye, 2000:36-37). Following this, all the twenty-three research and development institutes in the country came under the control of the ministry. In addition, universities of technology were established in the 1980s with the objective of expanding research in the areas of science and technology.

Some attention has undoubtedly been paid to Nigeria's technological development since 1970. In 1986, a national policy on science and technology was formally launched by the government to "promote scientific and technological manpower development" and to "encourage local research and development activities in both private and public enterprises" (Davies, 1988:148). However, up to the end of the 20th century. Nigeria remained a technologically backward country. The problem was obviously not that of poverty of policy or blueprint but commitment and provision of the enabling environment for technological advancement. For instance, the Federal Institute of Industrial Research (FIIRO) has consistently complained of inadequate funds which have made dramatic breakthroughs in industrial research impossible. The research leading to the discovery of the possibility of incorporation of up to 10 per cent of cassava to wheat composite flour for bread making remains the only known 'breakthrough' of FIIRO in as many years (*Sunday Punch,* 2008:29). Although this discovery is important since Nigeria has cassava in abundance and hopes to save millions of dollars from wheat importation, much more has been expected from FIIRO.

Regarding the development of industrialization, a steady progress was recorded from 1970 to 1975 as the price of oil, which became Nigeria's major export commodity, rose steadily in the international market. The total number of manufacturing

establishments in Nigeria rose from 1,054 with 127,162 people employed in 1970, to 1,290 establishments with 244,243 people employed in 1975. The value of production also rose from about $844,638,000 to $2,611091,000 during the same period (Arikawe, 1987:112). However, by the end of the decade, things had begun to slow down as a result of the fall in the price of oil in the international market and global economic recession. The trend continued throughout the 1980s. Table two shows the performance of manufacturing establishments in Nigeria from 1963 to 1980 and reveals the trend already described.

Table 2: Trend of Manufacturing Establishment in Nigeria, 1963-80 (Employing Ten or More People)

Year	Federation Total	Federation Total	Federation Total $'000	Federation Total $'000
1963	646	65,798	274,402	109,860
1964	687	763,342	358,778	137,466
1965	776	95,614	444,872	172,582
1968	625	86,728	503,038	207,672
1969	639	102,532	636,036	392,704
1970	703	127,162	844,638	392,704
1972	1,054	167,626	1,046,640	494,855
1973	-	-	-	-
1974	988	166,540	1,339,966	1,185,334
1975	1,290	244,243	2,611,091	1,750,499
1976	1,276	271,382	3,814,820	1,989,465
1978	1,064	300,397	6,921,399	3,504,547
1980	1,243	290,690	-	-

Source: J. Akintola Arikawe, "The Rise of Industrialism in the Lagos Area", in A Adefuye *et al*, (eds.) *History of the People of Lagos State,* Lagos: Lantern Books, 1987, p.112.

The economic recession which characterized the 1980s adversely affected industrial development. In 1986, the government introduced the structural adjustment progermme, which was expected to turn the economy around and stimulate industrialization. This, however, accomplished very little. As part of the reforms, the government decided to pay more attention to the development of small scale enterprises (SSEs). The National Economic Reconstruction Fund (NERFUND) was established in 1989 to grant the SSEs loans with low interest rates. After six years of operation, only 88 projects had received some form of assistance from the agency. The People Bank of Nigeria (PBN) which was established also in 1989 had a similar experience with the NERFUND (Alli, 1997:344-345). It was established to grant loans to SSEs with low interest rates and to assist groups of artisans and traders to start or expand business by providing loans and guidance. Although it performed fairly well in the first three years of its establishment, the PBN soon became a haven for people with little or no interest in the development of SSEs.

The result was that in the second half of the 1980s and throughout the 1990s, the industrial sector in Nigeria continued to perform poorly, contributing to less than ten per cent of the GDP. The sector recorded a negative growth rate of 3.6 per cent between 1981 and 1987. Capacity utilization also reduced drastically. In 1992, the average manufacturing capacity utilization was only 37.2 per cent (Olusoji, 1998:190). The political crisis which engulfed the country following the annulment of the 12 June 1993 elections further adversely affected the performance of manufacturing as it did to all the other sectors of the economy. In 1993, the contribution of industrial manufacturing to the Gross Domestic Product was a paltry 7.4 per cent. This decreased to 6.9 per cent in 1994, and

further down progressively throughout the rest of the decade (Njoku, 2001:229). Only a slight improvement was recorded in the opening years of the 21st century as the new civilian government of the Fourth Republic struggled to improve the fortunes of the industrial sector, with very little success.

What remains to be discussed is the reason for the low level of technological and industrial development in Nigeria since 1960 in spite of the recognition of their importance and despite all the effort of successive governments in the country.

Reasons for Low Level of Technological and Industrial Development

An examination of the process and means by which Nigeria tried to pursue its technological and industrial development since independence brings to light the reasons for the low level recorded during the period. It is important to understand these factors in order to be able to make positive recommendations on the problems.

As far as technological development is concerned, a major reason for its low level is lack of commitment on the part of government and relevant agencies. The measure of attention that is required for a country with abysmally low level of technology like Nigeria has not been given. (*The Guardian* 2008:31)[1] This is reflected in the amount of resources allocated to the sub-sector and government policies to regulate it. Ernest Shonekan noted in 1990 that "there is no gainsaying that compared with many other countries worldwide, Nigeria and other African countries allocate paltry resources to research and development" (Shonekan, 1999:25). Between 1971 and 2001, allocations to the development of science and technology were an average of 0.9 per cent of the federal budget and 0.3 per cent of the Gross National Product (GNP) (Davies, 1998: 150-151). When this is compared with allocations to defense which averaged over 10 percent in the same period, the problem of technological development in Nigeria can be well appreciated. Ebun Davies argues that "this is unlike the level of funding for science and technology in the developed countries where allocations to scientific research range from 2 to 3 per cent of the GNP" (Davies, 1999:150). With inadequate attention and resources, it is hardly surprising that the level of Nigeria's technological development has remained low (*The Guardian*, 2008:23).

Many analysts of Nigeria's technological development have wondered why government attention to the sector has been so low over about four decades. This is because successive governments have expressed their recognition of the importance of, and commitment to the sector. The efforts of different regional governments from 1954 to the early post-independence period have already been discussed. In 2006, President Olusegun Obasanjo declared 2007 as the Year of Science and Technology. It was stated that science and technology would be deployed to fight poverty, hunger and disease and promote overall development in Nigeria. Some 24 billion naira ($150 million) was to be appropriated to promote the development of science and technology (*Sunday Punch*, 2010:39). As part of the package, science and technology parks were to be established across the country to provide clusters for activities related to science and technology. It

[1] *The Guardian*, Lagos, 12 March 2008, p.31.

was projected that small and medium-scale enterprises would tap into the opportunities and facilities provided by the parks.

Attention was also to be paid to the National Science and Technology Museum which would offer opportunities in other aspects of technological development. Conscious of the need to enhance the country's technology of power generation, the government proposed the setting up of a Solar Panel Development and Manufacturing Pilot Plan. It was expected that solar power generation would complement power generation by the existing power company which is mainly gas and hydro based. The government stated correctly that the solar panel development efforts were in line with contemporary practice globally where emphasis has been placed on clean and renewable energy. Government efforts to develop technological development in 2006 and 2007 also involved the proposal to promote computer-aided design and manufacturing facilities aimed at improving the quality of locally- manufactured products (*The Guardian,* 2008:23).

Undoubtedly, the attention paid by government to the development of science and technology in 2006 and 2006 was a positive development to the sector. However, the enthusiasm that was reflected in the articulation of policy was not matched by action. A lot was done, by so much was left unattended. A major problem revolved around non-release of appropriated funds which were inadequate in the first place. Blighted by inadequate funds, many aspects of the policy could not be implemented. Furthermore, Obasanjo's tenure as president expired in 2007 and Umaru Yar'Adua, who succeeded him did not display sufficient enthusiasm towards technological development even though he was a scientist by training. The overall consequence was that Nigeria remained technologically backward at the end of the first decade of the 21st century (*The Guardian,* 2009:16).

Closely related to this is the attitude of Nigerian industrialists. The average Nigerian industrialist is too much in a hurry to get returns on investment. He is therefore reluctant to commit resources to research and development, which makes technological advancement possible. All too often, Nigerian industrialists are content with assembling or even just packaging products which makes it possible for them to quickly secure their returns. In such an environment technological advancement could hardly take place.

The lack of adequate commitment on the path of government and the attitude of Nigerian industrialist combine to create an acute shortage of equipment and material required for technological development. Thus, both at the Institute of Industrial Research and the different polytechnics and universities of technology, the prevailing condition is that of shortage of equipment to carry out research (*Daily Champion,* 2010:25; *The Guardian*, 2009:16)). Bereft of materials to work with, the average researcher with interest and energy often ends up frustrated. A few of these manage to find their ways abroad where they have the right equipment to work with and where the enabling environment to effectively function exists. Some of these have gained popularity after making intriguing breakthroughs. Of course such feats can only benefit the countries where such Nigerians are based. Such is the experience of Nigeria's technological development.

For industrial development, the factors which have hamstrung its expansion are related to those discussed above for technology. In many respects government policies and activities have played a great role in this (*The Guardian,* 2009:46-47). In this regard, a

major problem which had been identified is that of the path taken by government to promote industrialization both during the colonial period and since independence. Like most other courtiers of the Third World, Nigeria adopted the import substitution industrialization (ISI) as it strategy for industrial development. This is the strategy whereby the final states of industrial production are completed in a country with inputs imported from other countries usually more technologically advanced (Njoku, 2001: 230). It was thought that this strategy would help to generate employment, increase real per capita income, promote forward and backward linkages and stimulate local industrial capacity through some sort of technology transfer. (Lensink, 1996:3).

In the Nigerian case, the expected positive effects of this strategy failed to materialize. Studies have revealed that although the amount spent on total imports declined in the first two decades of Nigeria's independence, an addition of the amount spent on the importation of machinery, spare parts, foreign technical personnel and raw materials, gives a fare higher figure than if finished product had been imported. In addition, not much employment had been generated and the much desired technology transfer as well as forward and backward linkages did not take place. In separate studies, Onwuka Njoku and Festus Egwaikhide have concluded that the ISI strategy has been an abysmal failure in its application in Nigeria, especially from independence to the end of the 20th century. Egwaikhide stated that "after more than three decades of its implementation, it became clear that this model may not be the panacea to Nigeria's underdevelopment" (Egwaikhide, 2020:208). For Njoku, at independence hopes were high regarding the capacity of the ISI strategy to gradually but surely transform Nigeria to an industrial giant in a few years. However, at the end of the 20th century, "the expectation … proved forlorn. Four decades after independence and industrial production, the imported technology of the manufacturing firms had not been able to nurture a viable technological capability" (Njoku, 2001:232). The conclusion therefore is that the ISI strategy failed and it has contributed to Nigeria's low level of industrialization.

There is however the question as to whether Nigerian policy makers at independence had a choice other than ISI since the strategy had already been used by the colonial authorities long before 1960. Another is whether there was an available alternative even if the inadequacies of the strategy were known. These are questions to which there are as many answers as there are analysts. What is however beyond dispute is that the vast majority of the newly independent countries in different parts of the world from the 1940s adopted the ISI and in most of them the expected positive results failed to materialize (Rapley, 1996:39-40).

Apart from ISI there have been numerous policies of government which have militated against industrial development. Some of these relate to import regulations which have been inconsistent, and different kinds of taxes that have been imposed by the government at various levels. A case in point was the land charges that were introduced by the Lagos State Government in 2000 which caused a great deal of disquiet among owners of factories in the State. It was not after intense criticism and fierce resistance that the government was compelled to drastically reduce the charges after about three years. The government has therefore played an important role in Nigeria's low level of industrial development, as in many other facets of life (*The Guardian*, 2009:19-20).

Closely related to the above is the problem of securing capitals fro industrial development. Loans provided by commercial and merchant banks have for many decades now, attracted interests beyond the twenty per cent mark. This is in addition to the stringent conditionalities that are attached to the granting of such loans. The interest rates simply make it impossible for industrialists to go for bank loans even when they are able to fulfill the requirements for securing loan from banks. For a period, in the 1970s and 1980s, the Nigerian Bank for Commerce and Industry (NBCI) which was established in 1973, and the Nigeria Industrial Development Bank (NIDB) came to the rescue. But their efficiency was short-lived as a result of several constraints, not the least scanty attention on the part of government and corruption of the officials of the banks (Umoren, 2001:48). In the first decade of the 21st century, the dearth of capital remained one of the greatest problems facing industrial development process in Nigeria.

As noted above, corruption played a vital role in the failure of government efforts to establish special banks to provide funds for industrial development. It should be stated that corruption, which has become endemic in Nigeria since the 1980s, had deleterious effects on the development of technology and industrialization, as other aspects of Nigeria's social and economic life. Virtually all the agencies involved in the formulation and execution of government policies on industrialization ended up becoming enmeshed in one form of corruption or the other (Njoku, 2001:233-235). This is well illustrated in the efforts of successive governments in Nigeria since 1970 to develop the iron and steel industry which is regarded as very crucial to industrial development.

Efforts to develop the iron and steel industry in Nigeria began in 1958 when some Western European firms were contracted to carry out feasibility study on the iron and steel industry. The result of the study was negative. However, in 1967 a Russian firm was contracted to do another study and the result was positive. Following this, a decree was promulgated in 1971 which established the Niger Steel Development Authority (Njoku, 2001:188). Work began on the Delta Steel Complex, Aladja (DSCA) in 1979 and the Ajaokuta Steel Company (ASC) in 1981. The Aladja Steel Complex managed to function for a while in the 1980s and early 1990s, producing at about 20 per cent capacity before being shut down. The Ajaokuta Steel Complex scarcely produced anything after over $3 billion had been spent on it. In August and September 1996, M. Wakawa, the Managing Director of the Ajokuta Steel Complex auctioned vital equipments of the company at "ridiculously give-away prices" and with impunity. By 1997, ASC owed Tiaproxport (TPE), the contracting Russian firm $3.1billion. The Abacha government arranged for a debt buy-back deal in which Panar Shipping Corporation (PSC) of Liberia bought the debt for $500 million. Surprisingly, the Nigerian government bought back the bills from PSC (which was obviously working on behalf of the Abacha family) for the original price of $3.1 billion. The difference of $2.6 billion was said to have been shared between the Abacha family, Bashir Dalhatu, the Minister of Power and Steel, and Anthony Ani, then Minister of Finance (Njoku, 2001:236). By the end of 2002 the iron and steel industry in Nigeria remained comatose, producing nothing and bogged down by billions of dollars of debts. The nagging problem of corruption would therefore need to be tackled for Nigeria to make any meaningful progress in its industrial development efforts.

Yet another reason for the low level of industrialization in Nigeria is poor infrastructure. It is common knowledge that in most parts of Nigeria, even the most basic infrastructure such as roads, water and electric power are either non-existent or function poorly (*Sunday Vanguard,* 2010:39). In many instances, industrialists have had to provide these themselves with result that the cost of production has been very high. In fact, it has been calculated that production cost in Nigeria is one of the highest in the world. A major consequence of this is that due to high cost of production, imported goods produced in Nigeria to be uncompetitive and attempts to export them extremely difficult.

The frustration of industrialists as a result of poor infrastructure is well illustrated in the case of electric power supply. Then agency established by government to carry out this important function was for many years the National Electric Power Authority (NEPA), now renamed Power Holding Company of Nigeria (PHCN). It was created in 1972 from a merger of the Niger Dam Authority which was established in 1950 and the Electricity Corporation of Nigeria (Njoku, 2001:227). In spite of its long period of existence, electricity supply from government source is non-existent in many parts of Nigeria as a result of not having been connected to the national grid. In most other parts where electrification has been carried out, supply is so epileptic that most times owners of industry rely more on private generators. The cost of running generators being so high, irregular power supply from public source inevitably leads to high cost of production.

For industrial production, the problem of irregular power supply has been compounded by the acute shortage of refined petroleum products which has become major feature in Nigeria's energy sector since 1993. The consequence is that it has been difficult to secure petroleum products to run generating sets when there is power outage from government sources. Some factories are known to have shut down temporarily during periods of scarcity of petroleum products. Even when petroleum products have been available, the costs have been so high that owners of industry have had course to express their frustration to government on several occasions. All these have left the industrialist sometimes confused and many local and foreign entrepreneurs are known to have been discouraged from either embarking on new projects of industrial production or expanding existing ones (Umoren, 2001:61-62). It is for this reason that scholars of Nigeria's industrial development are agreed that rapid development of infrastructure is necessary for any substantial improvement of industrialization in the country to take place.

The factors responsible for the low level of technological and industrial development in Nigeria are many and diverse as is evident from the above discussion. These and other not too prominent ones would need to be addressed before there can be an improvement in the development of technology and industrialization in Nigeria.

Nigeria's Crisis of Development

The Nigerian economy has performed far below expectation since independence in 1960. The high hopes that were raised were quickly dashed in the course of the first decade of independence and the economy entered a deep recession in the 1980s. For instance, Nigeria's per capita GNP stood at between 1000 USD and 1,100 USD between 1975 and 1980. This dropped to just about USD400 in the early 1980s and even less

sometimes during the 1990s (Obadina, 1999:8). A measure of improvement was recorded in Nigeria's economic fortunes from 2000-2010, and per capita GNP did reach $1,400 in 2009, but the overall performance could be described as low in comparative terms at the end of the first decade of the 21st century (Saba et al, 2001:287; *The Africa Report*, 2001:218-219).

The low level of the development of technology and industrialization has contributed a great deal to Nigeria's poor economic performance since independence. The economy is dominated by the exportation of crude petroleum which accounts for over 90 per cent of export earnings. As the government seemed, for the most part, content with collection of rent from oil companies, the economy has not been diversified. This has limited economic opportunities and overall economic performance has been affected by the vagaries of international oil prices. This was the case in the early 1980s, from 1998-1999 and 2008-2009. Reliance on a single primary export product as a result of low level of technological and industrial capacity has also limited the opportunities for regional economic integration. There have simply been few items that Nigeria has been able to export to neighbouring states and as a regional power from which much is expected, this deficiency has contributed to the low level of international trade in West Africa (Aworawo, 2010:1321-134). Nigeria's low level of technological and industrial development has therefore contributed a great deal to the country's economic crisis in the last five decades.

Conclusion

The above analysis has revealed that Nigeria has not fared well in her quest for industrial and technological breakthrough since independence. It has remained a challenge which has not been successfully tackled over the years. The realization that virtually all the countries that have become economically strong and stable, with a high living standard for its people, have attained substantial level of industrialization, has made it important for the government and people of Nigeria to be concerned about the low level of industrialization of the country. Our analysis has shown that there is an interlocking relationship between research and technological advancement, industrial development and economic growth. Undoubtedly, the bulk of the responsibility for improving the level of technology and industrialization in Nigeria rests on the government. The government at various levels would need to formulate sound and consistent policies and provide adequate funding. They would also need to pay attention to the expansion of infrastructure and provide an enabling environment for researchers and industrialist to function. The private sector would also need to play its part by contributing to research and development as well as utilizing the results of research. It is important for owners of industrial establishments to be patient and avoid the tendency to make quick profit which has turned many an industrialist to a trader. The wide range of problems identified earlier would need to be addressed for the fortunes of technology and industrialization in Nigeria to improve in the rapidly changing economic climate of the 21st century.

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