

Technological and Industrial Development in Transitional Societies: Some Lessons from the Failed Projects in Nigeria

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ABSTRACT The development of African continent has been in the front burner in both academic and intellectual discourse. Industrialisation has been identified as a key factor in economic development. Technology propels industrialisation, and this in turn incubates and gives conducive technology infrastructure environment. However, efforts by some countries in Sub-Saharan Africa to industrialise and achieve technological development have not materialised. Using two failed automobile and steel industrial projects in Nigeria as examples, and situating the discussions of the failure of the projects within the context of modernisation theory, this paper identified poor planning, political instability, poor technological infrastructure, poor small and medium enterprise support and over politicization of industrial projects as the bane of technological and industrial development in Nigeria. Consequently, the paper argued that for there to be industrial and technological development, the problems of policy inconstancy, corruption and mal-administration and political instability in Nigeria and by extension the African continent must be tackled head on.

INTRODUCTION

Developing transitional society like African continent has remained an albatross around the necks of successive governments. This explains why the issues relating to development discourse often evokes emotion and cannot be exhaustibly discussed. According to World Bank (1991) the future development of any nation or by extension continent depends largely on technological progress. This position appears well informed when one considers that the economists traditionally consider an increase in per capita income to be a good proxy for indicators of development. They assume that growth in per capita income induced by growing productivity is the engine of development. In turn, it is technological progress that drives productivity.

This essentially brings into more sharper focus the issue of industrial development. This refers to the process by which a nation acquires competency in the manufacturing of equipment and products required for sustainable development, and technology is considered as the prime mover (Hirschman, 1958). Infact industrial development and technological development are interdependent and interrelated. While on one hand, technological development is prerequisite for industrial development, on the other hand, industrial sector is the major propelling force for technological development

and innovation. It is important to note that neither can flourish unless there is adequate technological infrastructure in place (Kirkpatrick et al, 1985; Evenson and Wesphal, 1994; Afonja, 2003; Barry and Reddy, 2006).

The economic development of any nation depends critically on the ability of their society to establish the sustained technological progress, many key aspects of which currently are changing at an accelerated rate (Thirlwall, 1989; Mytelka, 1995). Industrial development is one of the most potent propellants of economic and human development and it is measured primarily by the ability to manufacture goods, particularly capital goods. Sutcliffe (1971) opines that the purpose of industrialisation is to provide a higher material standard of life for most of the world population. Several variables characterise the level of industrial development: capital goods production as percentage of total good manufactured capital goods production, manufacturing value – added (MVA), level of energy consumption, gross national products (GNP) growth rate, level of human development, on the basis of these variations countries are classified as Highly developed/Industrialised Countries (HICs), Industrially/New Industrializing Economies (NIEs) and Developing/Less developed Countries (LDCs).

All African countries fall into the developing categories although there is considerable variation in the level of development between

countries in the region. The level of industrialisation is also highly indicative of the level of technological development in view of the close interdependence (Adeyeye, 2006b). This is buttressed by Sutcliffe (1971) that although industrialisation is not a prerequisite for economic development no nation has become economically developed that has not industrialised.

There are various routes to industrialisation but there seems to be distinction between routes taken by each of these three main groups categorised above. In the case of the countries which have successfully industrialised, a good deal of technology in use was developed within the country itself. Hence Japan, China and former Union of Soviet Socialist Republic (USSR) borrowed foreign technology extensively, but selectively. Also the ability to borrow and apply technology so effectively and successfully is indicative of considerable adaptive and innovative capability. The Newly Industrialising countries, notably South Korea, Taiwan, Singapore, and Hong Kong have followed heavily export-oriented strategies that targeted dynamic market segments and have relied heavily on imported technology (Oyalaran-Oyeyinka, 1997; 1998; Odeyemi, 2005; Nkurunziza, 2006). Most of the countries in this group initially adopted the strategy of promoting direct foreign investment or foreign licensing but quickly moved to the importation of capital goods which formed the basis of learning by reverse engineering. Some of the countries also adopted a creative mix of export promotion and import substitution. All of them have to take advantage of a capable but relatively cheap labour force and consequent low production costs, and are increasingly competing in the international market on the basis of low-cost skilled engineering and technical labour (Afonja, 2003; Zachary, 2006).

It is pertinent to note that many of the countries are emerging from imitators of the world leaders in technology. Most developing countries, partly through government policy and because of the role of foreign industrial capital, adopt import substitution industrialisation but without the essential technological experimentations and concomitant training in innovation which are characteristics of the pioneer industrial countries (Sutcliffe, 1971; Westphal et al., 1985; Aina, 2006). This strategy which involves wholesale importation of advanced foreign technology and direct foreign investment is not

accompanied by development of material capability to adapt or maintain the imported technology, or to build on it to develop new industrial techniques more appropriate to their situation. The result has been that as import substitution possibilities come to an end, industrial process has tended to grind to a premature halt. Foreign investors also actually deliberately adopt policies which stifle the internal acquisition of technological capability since such a development would erode their relevance and dominance of the economy (Laditan and Esubiyi, 1996; Oyalaran-Oyeyinka, 1998; Afonja, 2003; Nkurunziza, 2006).

TECHNOLOGICAL AND INDUSTRIAL DEVELOPMENT IN SUB-SAHARAN AFRICA

The relationship between technological and industrial development is two-way approach. Whereas technological development fuels industrialisation and promotes the development of the capacity to manufacture goods, particularly capital goods, industrial development in turn provides the impetus for technological development and innovation. Development has almost always involved a shift in the sectoral composition of output. Agriculture's share of production and employment which is typically high at the early stages of development begins to decline while that of manufacturing industry tends to increase (Akamatsu, 1962; Herrick and Kindleberger, 1984). A major prerequisite for this transformation is the acquisition of technological capacity – that is, the ability to select, diffuse, develop or adapt technology and build on imported technology. Countries that have experienced rapid growth in recent times (notably Singapore, Korea and Taiwan) have adopted the strategy of importing and building on established technology from abroad (Westphal et al., 1985; Barry and Reddy, 2006; Nkurunziza, 2006).

Developing countries are characteristically exporters of unprocessed raw material required in the industrialised countries, both as inputs for their industries and, in some cases as food for their predominantly urbanised population. However, most of them have not been able to effectively apply the proceeds of industrialisation. Africa, in particular, sub-Sahara Africa, is considered the least developed region of the world, based on universally accepted develop-

ment indicators, in spite of the very rich natural resource endowment (Hodder, 1973; Odeyemi, 2005; Adeyeye, 2006a, b). Some of the world's best iron ores are located in Liberia and Guinea; Zimbabwe is the world's largest producer of germanium and cobalt; Zimbabwe produces 65% of the world's output of corundum and holds about a quarter of the world's reserves of lithium; Zambia is one of the world's most important sources of copper; Nigeria has a significant proportion of the world's reserve of petroleum, tin, columbite and tantalum; Namibia is a major producer of arsenic, vanadium, lead zinc, lithium and uranium; South Africa is the world's largest producer of antimony, gold, platinum, rubidium, chromium, vanadium and gem diamond, second only to Russia in the production of manganese and palladium, and third in the production of asbestos. The underdevelopment in the sub-region in spite of the enormous resources is due to several factors which included political instability and poor leadership in most of the region, unrealistic, incoherent, poorly articulated and unstable development and industrial policies, wrong strategy for the acquisition of technology capability; inability to export value-added natural resources; lack of adequate manpower with the right mix of skill and proper orientation to cope with the challenges of economic, technological and industrial development amongst others (Babalakins, 1982; World Bank, 1999; Barry and Reddy, 2006; Adeyeye, 2006a).

Industrialisation in Africa has been largely as a result of import substitution strategy. Prior to industrialisation the trade in most countries was dominated by multi-national companies. Many of these companies eventually imported technology for local production of their main lines, taking advantage of cheap labour. This approach to industrial development has done very little to stimulate the acquisition of local technological capability since the choice of technology, equipment, installation as well as the simple routine maintenance are carried out by expatriates. Unfortunately, public funded projects do suffer from technical partner syndrome (Afonja, 2003; Zachary, 2006).

One of the first steps in starting most public project is the appointment of a technical partner who selects the technology and equipment. Quite often the selected partner lacks competency and sub contracts the project to third parties. These technical aspects of the project are designed to

ensure perpetual dependence on the technical partner, with little or no chance of technology transfer to local personnel (Tambunlertchai, 1994; Zachary, 2006). By contrast, India at the initial state of industrial development relied heavily on the purchase of franchise of well established technologies. The technical skills gained in operating these franchises eventually led to the development of local capability to manufacture similar products locally and today, India is a major exporter of technology, particularly industrial machinery (machine tools, electric motors, diesel engines, high technology furnaces, etc). The point here is that technical progress is a vital requirement for sustainable industrialisation. However, the type of industrial growth which has taken place in Africa has failed to stimulate technical progress as shall be demonstrated shortly with two industrial projects in Nigeria (Chenery, 1960; Oyelaran-Oyeyinka, 1997; Afonja, 2003; Arowolo, 2006).

Despite the fact that most of the countries in the sub-region spend substantial proportions of their annual budgets importing technology and the products of technology, there has been little progress in the acquisition of technological capability. The Gross National Product (GNP) and the growth rate of GNP per capita index for the region are among the lowest in the world (World Bank, 1999; Adeyeye, 2006b; Aina, 2006). The wholesale adoption of complex western industrial techniques which in many cases grind to a halt or have made little impact on industrial development has been the practice of many countries in the sub-region. Quite often, the problem is not due to failure to assimilate technology but the absence of adaptation to new technology which further industrial growth needs.

In a study by Gapanski (1996), using economic variables of output, labour and productivity growth rate over a period of 1951 – 1990, it was shown that African countries are far behind Organization for Economic Cooperation and Development (OECD) countries in economic growth as shown in table 1.

Even within Africa there is a very wide disparity and it is possible to group the countries of Africa into two: Group A comprising Algeria, Egypt, Morocco, South Africa and Tunisia while Group B encompasses the remaining 43 countries. The development variables for each group and OECD countries are shown in the table

Table 1: Economic growth in Africa countries compared with OECD countries.

Group	Output Y	Labour L	Productivity Growth, Y
Group A Africa	39.4	5.9	2.4
Group B Africa	5.6	3.3	1.4
OECD Countries	290.4	13.7	3.0

Source: Gapanski, J.H. (1996).

Note: Output Y is measured in billions of 1985 international dollars, Labour L is given in million of workers, and productivity growth rate in percent

above. All the counties in Sub-Saharan Africa except South Africa fall in Group B (Adeyeye, 2006b).

Compared with other countries in the sub-region, South Africa has superior technological infrastructure and technological capability. The level of industrial and technological development is very high. The country is the 19th largest producer of automobile vehicles in the world, with an annual output of about 400,000 units annually (Ernst and O'Connor, 1989). Apart from supplying the local market, South Africa exports fully built vehicles and vehicle components to Africa, Asia, Europe and the U.S. The chemical industry is also very strong, and ranked among the top 25 in the world. South Africa produces aero engine components, manufactures helicopters, and is the leading world effort in the development of high-technology Pebble-Bed Modular Nuclear Reactor (PBMR) (Ernst et al., 1994; Lall, 1994).

Technological and Industrial Development: The Case of Nigeria

Nigeria is one of the richest countries in Africa in terms of natural and human resources. The country is the sixth largest exporter of crude oil and has extensive reserves of natural gas, solid minerals and forest resources (Afonja, 2003), but is also one of the poorest in terms of human development and poverty, trailing behind Gabon, Cameroon, Kenya, Ghana, Lesotho, Namibia and Botswana. A columnist in one of the international weeklies recently compared the pace of industrialisation in Nigeria and Japan. He aptly described Nigeria as "that country which has *everything* and produces *nothing*, and Japan as that which has *nothing* and produces *everything*". The industry is at a rudimentary stage of development, mostly producing import substitution and low-technology products.

Attempts to develop more technology intensive industries have failed woefully. Four of the six automotive plants have collapsed and the surviving duo are operating at less than 10 per cent capacity; the three paper projects have closed down; the five steel projects are in comatose; the petrochemical and fertilizer plants are operating epileptically and the small scale industrial base has collapsed (Afonja, 1994; Oyelaran-Oyeyinka, 1997; Arowolo, 2006).

A critical review of two national projects which were designed to stimulate the development of industry and acquisition of technology will not only buttress the above point but will also highlight major fundamental and structural problems which have militated against the full industrialisation of the nation. The two major projects examined were purposely selected because they should have held the key to technological and industrial development of the country and more importantly vital lessons could be drawn from the manner they were established and managed thereafter.

The Automobile Industry

The case of the automotive industry particularly highlights the flaws in Nigeria's development strategy. In pursuance of the strategy of import substitution industrialisation, government in the mid 1970s commissioned six automobile plants, all of them assembly plants on turnkey basis. They comprised two passenger car plants and four commercial vehicle plants. According to the terms of the agreement between the government and the foreign automobile companies, the selection of technology, backward integration and progression from assembly to manufacturing were virtually left to the discretion of the latter. For example, although the contract agreement specified that the car assembly plants must achieve a 50 per cent local content by value within five years and 100 per cent in thirteen years, a recent survey indicated that, after over twenty five years of operation, the only surviving plants have not achieved more than about 20 per cent locally manufactured component input and this has been limited to components which require rudimentary technology. These include; manufacturing of windscreen which involves cutting up imported sheet glass and pressing to shape, production of ignition coil which merely involves the assembly of foreign manufactured

components, petrol tanks constructed from three-piece, pre-pressed imported components, batteries assembled from imported plate and shell components, upholstery and tyres. To date no single local manufacturer makes simple bolts and nuts of acceptable automotive quality. The foreign partners in the car assembly projects claimed that the contract was not explicit on who was expected to produce the local components. The usual practice internationally is that, while automobile plants may set up subsidiaries to produce such critical components as the engine and transmission, the bulk of the inputs are sourced from independent small companies (Kayode et al., 1994; Afonja, 1994, 2003; Aina, 2006).

Unfortunately the Nigerian environment has not been conducive to the proliferation of small manufacturing companies capable of making automotive components of acceptable quality. Furthermore, the proliferation of models of Nigerian cars has given wide latitude for substantive product differentiation, which makes local manufacture of components unattractive and uneconomical. In over thirty years of operation, one of the car assembly plants has introduced as many as twenty five models, apart from the hundreds of other models of imported new and used vehicles (Arowolo, 2006).

The experience of India is again relevant. India which has a population of at least ten times that of Nigeria commissioned only one car assembly plant which produced only one model in 1948. The model which was based on a famous British phased out model (the Morris Minor) has been retained to date but has been re-designed and upgraded. All the components are now manufactured locally by small companies which enjoy considerable government assistance, and can be purchased from a grocery store. About twenty years ago, the country introduced another model which happened to be another phased out European model. An obvious advantage of this strategy is that the tooling can be purchased very cheaply and the production technology easily mastered. Nigeria has a lot to learn from this experience (Oyelaran-Oyeyinka, 1997; Semenitari, 2005; Arowolo, 2006).

The Steel Industry

The steel industry is another major national project which has failed to achieve the planned

objective of stimulating technological and industrial growth. Planning for the national steel industry started in 1958 with the search for the major raw materials and the commissioning of market surveys. However the feasibility reports were negative but, in 1967 another study was conducted by United Nations Industrial Development Organisation (UNIDO) which established a potential market for steel products. This led to the commissioning of geological survey by the Soviet Union to determine the availability of the major raw materials. Based on the results, the Nigerian government decided to set up an integrated steel plant to produce 1.3 million tons per year of steel by the blast furnace route primarily for construction, although the proposal by the technical partners was for an equal mix of long products (constructional steel) and flats (manufacturing steel), apparently because of the boom in the construction industry in the mid 1970s. The Nigerian Steel Development Authority (NSDA) was set up in April 1971 to work with the technical partners (Techno-export of the Soviet Union) in planning and execution of the project. The project was one of the core projects listed in the Second National Development Plan (1970–75). The friction between the NSDA and the supervising Ministry (Federal Ministry of Industries) led to the initiation of a rival project by the latter, based on the direct reduction route (Berger, 1980; Afonja, 2003). Both projects adopted the same product mix and the combined design capacity by far exceeded the market projections for steel profiles, which constituted only about 40 per cent of the potential steel market. The demand for flat steel was much higher (about 60 per cent). Curiously, government decided to adopt the projects, locating the blast furnace plant in Ajaokuta in Kogi State (Ajaokuta Steel Company) and the direct reduction plant (Delta Steel Company) in Aladja in present Delta state.

Delta Steel Plant was designed, as an integrated facility comprising four electric steel furnaces to feed four rolling mills. For socio-political reasons government decided to relocate three of the rolling mills in Osogbo, Jos and Katsina (Gana, 1987; Zachary, 2006). This decision spelt doom for the rolling mills from the start. There was no provision for transporting the surplus billets to be produced by Aladja to the rolling mills. There was no rail link between Delta Steel Plant and any of the rolling mills and

road transportation was impracticable since each rolling mill would require one thousand tons of billets daily (about fifty trailer loads). For the simple fact that Delta Steel Plant was run as government parastatal, it never achieved more than about 15 per cent capacity utilization in about fifteen years of operation, hence, apart from transportation difficulties, billets were in short supply. The rolling mills were starved of billets and had to depend on importation. This created enormous technical problems for the three plants which also operated as government parastatal (Afonja, 1994, 2003).

Ajaokuta Steel Plant had two major technical problems: The location was virgin land and had virtually no infrastructure; hence much of the initial effort was to put an infrastructure in place. Secondly, coking coal which is the most expensive input raw material for iron production by the blast furnace route is not available locally (Afonja, 1994; Semenitari, 2005). Importation would be too expensive and transportation to site would create a major logistical problem. In spite of the fact that the first phase is yet to become operational after nearly three decades, government had twice commissioned feasibility studies for the second phase.

Inadequate and epileptic electric power supply was a major problem for all the plants. If the five steel plants had become fully operational, the power demand would have accounted for about 50 per cent of the national power generating capacity. The two integrated steel plants should have had capacity power plants installed, as is being done presently (Ikechukwu, 2005; Zachary, 2006).

It is clear from the above that all the steel plants were destined to fail from the start due to poor planning and flawed decisions by government (Gana, 1987; Nwachukwu, 2006). The choice of the product mix comprising reinforcing steel for the five plants was also a major mistake, considering the fact that the bulk of the national requirements is for machineable and flat steel. It is significant to note also that the first private steel plant was commissioned in Emene, near Enugu, in 1962 and since then about twenty other private plants have become operational, all of them designed to operate on scrap steel or billets. Several of them have closed down due to the harsh economic environment and uncontrolled import of same products. However, about ten of them are operating at full capacity (Nwachukwu, 2006; Arowolo, 2006)

Theoretical Context of the Projects

The theoretical context of the above discussed projects could be located within the purview of modernisation theory of development. In a nutshell modernisation theory may be viewed as a major contribution by the structural-functionalist to development studies. According to Afonja and Pearce (1986) since modernisation is often taken as a special case of development, it should be noted from the onset that many elements within modernisation theory are capable of analyzing development process and rate. As regards development, the concept of modernisation has several interpretations. Many scholars view modernisation as a process (Bellah, 1964; Levy, 1966; Chodak, 1973). Eisenstadt (1966: 78) defined modernisation as “the process of change towards those types social, economic, and political systems that have developed in Western Europe and North America from the 17th century to the 19th and 20th centuries to the South America, Asian, and African continents”. For Europe the modernisation process was seen as self generating, the result of internal development occurring from within these societies. In South America, Asia and Africa, modernisation is seen as induced process which was often initiated by the colonial powers. As a process, modernisation meant the development of such phenomena as science, technology, industrialisation, education, a new kind of man, etc. along the same lines as the West. As reviewed by Bernstein (1971), modernisation was assumed to be a total social process which constituted a universal pattern. Modernisation is seen as goal which the newly independent states in African, Asia and Latin America should pursue as a path way to development. The present situation of the ‘advanced’ nations is taken as the reference point for the less advanced nations. Via the process of planned development, non-Western nations aspire to attain the conditions enjoyed by the West.

In elaborating this view, Inkeles (1967) noted that modernisation should be seen as a relative term, in which the goals never remain static. If the world is viewed as one international system, the condition of the advanced nations continually shifts. In so far as the less developed nations aspire to attain the institutional pattern of the West, the goal is a ‘moving target’. Thus modernisation is not a fixed condition.

Finally, modernisation is often seen as a period, a period of transition during which a society shed its 'traditional' characteristics such as particularistic, ascriptive, self-oriented and functionally diffuse and becomes dominated by 'modern' types of institutions and action (Parsons, 1971). In advocating development of these societies, it was also recognized that the desired type of change (Modernisation) might not be spontaneous. Thus the change must be guided. Diffusion was seen as the process whereby the new nations could change in the appropriate direction, as well as learn from the mistakes of the older nations (Spencer, 1897; Durkhiem, 1933). Diffusion would occur through the interaction of two major groups. External to the less developed countries were the foreign experts, advisors and funding organizations located in the West. Through them the appropriate capital, technology, values and advice would be injected into the traditional society. Among the new nations there were those who would play the role of modernizing agents. These groups (elites) were necessary for mobilizing the population to attain the pre-defined goals (McClelland, 1961). Social mobilization was seen by modernisation theorists as an essential ingredients in the new development. It has been defined as the 'process in which major clusters of old social, economic, and psychological commitments are eroded and broken and people become available for new patterns of socialisation and behaviour (Deutsch, 1961). The population must be planned for and exposed to structures, values and ideas which would make them ready for more modern roles. Thus the modernisation thesis has been applied to all segments of society including agriculture, values, and education to national integration and urbanization, and technology. Modernisation is seen as a comprehensive process in which the final outcome will be the emergence of societies that converge on the West European mode.

A major problem associated with the process of modernisation is the ability of the system to sustain growth and continually adapt to change. Many developing countries were seen as unable to cope. In fact, since development was often not forthcoming during the first decades when most African countries got their independence and many problems existed, explanations were needed for the disappointing situations. The dualist thesis and concept of breaking down were

offered by variety of scholars (Spengler, 1967). The developing countries were seen as plagued by the fact that both modern and traditional sectors and ideas still existed side by side each operating under different laws. Traditional structures were seen as a hindrance to modern development. Neither were viewed as an integral part of national or international structure. Structural duality along with the inability of central institutions to control the situation led to disappointing industrial and technological development (Afonja and Pearce, 1986; Zachary, 2006).

The projects discussed above could be located within the context of the failure of modernisation theory and its application to developing transitional African societies. Essentially the projects failed because they were conceived and patterned after the projects in the developed countries in which the technology was developed and imported into Nigeria without taking cognisance of the peculiarities and diversified nature of the socio-economic and political context of the country (Nwachukwu, 2006).

Reasons for Failure and Lessons to Be Learnt

The two projects reviewed above are typical of most of the public sector projects – paper, petrochemical, fertilizer plants, and refineries. Incidentally, virtually all public sector projects initiated at both the federal and state levels have suffered the same fate. Besides conceiving and patterning the projects after the projects in the developed countries in line with the dictates of modernisation approach, many other internal reasons have been adduced for the failure. These are;

First, the country has developed four National Development Plans since independence, all of them very comprehensive, probably over ambitious. Furthermore, they all lacked effective strategy for implementation and were characterized by numerous uncertainties. Inevitably, they were all unsuccessful since most of the listed development projects could not be implemented. The decision to revert subsequently to two-year rolling plans between 1990 and 1994 did not make any significant impact on the development process (Emeh, 2002).

Second, political instability has been the bane of most development projects in the country.

Nigeria had a change of government ten times since independence and prior to the current democratic administration, eight of them military governments. Each successive government developed its own strategy for development, with little respect for continuity. This had led to a political unstable environment, which has impacted negatively on development in general, and industrial development in particular. It also actively discouraged foreign investment (Ekpeyong, 2005; Semenitari, 2005; Zachary, 2006).

Further the development of technological infrastructure which is an indispensable prerequisite for industrial and technological development, has remained very poor – energy, transportation, small-scale industries, industrial base research and development culture, with the exception of communication which has recently improved considerably (Okafor, 2004).

Third, in Nigeria, Small and Medium scale Enterprise (SMEs) have the potential for acting as propellants for virile industrial and technological development and most newly industrializing countries place great emphasis on the provision of comprehensive support for this sector in their industrialisation process. Nigeria established several financial institutions – Nigeria Bank of Commerce and Industry, NERFUND, etc, to provide for the specific financial needs of small scale enterprise. Apart from the fact that the benefit derived by the sector from these institutions was minimal due to bureaucracy, it takes a lot more than finance to develop the SME sector. The fact that the technological infrastructure base of the country is so poor leaves SMEs with little choice but to provide them – electric power, water, even roads in many cases. This inevitably makes them uncompetitive and many have closed down over the last decade or so. Plans to develop industrial parks for SMEs, based on the Indian and Turkish models were never affected. The SMEs also have had to contend with uncontrolled importation and sale at cheaper prices of the same goods that they produce. The experience of India is pertinent here. At independence in 1948, The Prime Minister, Mahatma Ghandi made a monumental declaration of the country's industrial development strategy: "*What we can make we will use, what we cannot make we will do without.*" For decades, India followed this policy religiously, virtually shutting off importation of consumer goods. This policy

helped in no small measure the rapid development of SMEs to its present enviable status, capable of producing virtually all consumer goods for domestic consumption and for export. Many of the India products on the market in Nigeria are produced by small-scale enterprises – electric motors, pumps, diesel engines, electric power generators, machine tools (Emeh, 2002; Afonja, 2003; Barry and Reddy, 2006).

Fourth, most of the government attempts at establishing an industrial base have failed due to excessive interference, mostly motivated by socio-political considerations (Kayode et al., 1994, Berger, 1980; Suberu, 2005). The decision to start six automobile plants at the same time was an attempt to satisfy the geo-political zones of the country. For the same reason, three of the four rolling mills were moved from Delta Steel Plant. The location of the Ajaokuta Steel Plant was socio-political. Ajaokuta was not one of the potential locations identified in the feasibility study. There was also considerable interference in the management of the plants. The decision to establish a National Steel Council was never implemented and the two plants were controlled directly from the Federal Ministry of Mines, Power and Steel by two Directors, both of whom were graduates of Arts disciplines. For example, at one point, Delta Steel Plant had a full complement of personnel (about 5,000) when it was producing at only 15 per cent capacity (Mohr, 1987; Emeh, 2002; Afonja, 2003; Zachary, 2006).

It is often said that government has no business in business and cases in support of this statement abound all over the developed and developing worlds. The British steel industry suffered fortune reversal every time it became a public enterprise, until it was finally privatised about two decades ago; public enterprises in the communist world are grossly inefficient and there is already a considerable shift towards private ownership in some of the countries; most public enterprise in Sub-Saharan Africa are either moribund or running inefficiently (Kayode, 1993). However, this statement is not always true and there are examples of public enterprises running efficiently in some parts of the world. For example, Ajaokuta Steel Company Ltd (ASCL) and Pohang Steel Company Limited (POSCO) in India are both state owned companies, had similar design capacity, and took off around the same time (1971 and 1968 respectively). The investment in ASCL, so far, is about 30 times the commissioning cost

of POSCO. While ASCL is yet to take off, POSCO has grown to be the 10th largest steel company in the world, surpassing Japan and other Western steel producers in low cost steel production (Berger, 1980; Oyelaran – Oyeyinka, 1998; Emeh, 2002; Afonja, 2003).

From the foregoing the basic lessons that could be drawn from the two industrial projects considered above as well as the discussions regarding why the projects failed include that: *poor planning of development projects, political instability, poor technological infrastructure, poor small and medium enterprise support and over politicization of industrial projects* are major obstacles to industrial and technological projects in Nigeria, and perhaps, other African countries.

This has resulted why over the years and more importantly under the current democratic dispensation, government has embarked on aggressive privatisation programme of public enterprises to ensure efficient and effective performance of these enterprises and also in line with global demands of government handing off businesses it is not competent to run. Presently quite a number of public enterprises have been privatised. Promoting privatisation and public-private participation as a panacea to industrial and technological development of the country, El-Rufai (2002:16); the former Director General of Bureau of Public Enterprises, a cabinet minister and an ardent apostle of privatisation and Public-Private Partnership stated: *There are about 590 public enterprises at the end of 2000 and 160 are involved in economic activities, generating goods and services. Over 5,000 board appointments are to man these gigantic white elephants with enormous patronage bestowed on high official. About \$100 billion spent by FNG to establish these public enterprises between 1973 and 1999 with a return rate of meager 0.5%, employing 420, 000 workers. The quality of services from...NEPA...for instance, are deplorable and left much to be desired. Privatisation is the only solution to remove all the maladies that are prevalent and promote efficiency, transparency and corporate governance. We should let the government do what it is supposed to do, focusing on health, education, infrastructure, environmental protection and good governance.*

On the other hand, Momoh (2002: 34) while opposing privatisation and public-private partnership in Nigeria described the former as

an intension to replace state monopoly with private monopoly and described the latter as “nebulous and a big fraud”. He stated: *The way many of the enterprises are sold off leaves much to be desired. There is the issue of lack of proper valuing, incompetent valuers, fraudulent valuers etc. There is also the issue of assets which in some instances are not taken into account...the Nigerian private sector is one of the most inhumane, insensitive, callous and exploitative to be found anywhere in the world. Many of the private sector employers neither provide insurance nor social security for their employees. They do not obey labour laws and they sack workers arbitrarily, for good or bad reasons. Many of them do not have pension schemes etc. The private sector employers do not, in some cases, permit their employees to unionize*

CONCLUSION

From above discussion it is evident that combined factors led to the failure of industrial and technological projects that would have launched Nigeria into one of the most industrial nations in Africa. As indicated at the beginning of this paper, no country ever developed without being industrialised. Therefore industrialisation and investment in technology is at the heart of development. A situation whereby no single local manufacturing outfit has succeeded in producing automobile quality bolt and nut has not helped in the country’s efforts to develop an automobile industry. Consequently there is an urgent need to set up specialized and well equipped industrial and technology villages across six geo-political zones in the country for foundry and light engineering, and to provide the necessary infrastructure and funding for rapid development in the sector. This is the route that India took in the early 1950s to establish her current virile SME sector which produces everything from electric motors, machine tools, industrial machines, to high-technology components, many of which are exported to industrialised countries. This development has also enabled India achieve her current enviable state of 100 percent local manufacture of all required by the automobile industry. The ambitious and white elephant approach to industrial development which dominated the last three National Development Plans in Nigeria should be reviewed in favour of

comprehensive support for Small and Medium Enterprises.

In addition, to tackle these factors which have kept Nigeria far away from industrial and technological development, the problems of politicization of industrial projects, poor planning, mismanagement and corruption, political instability, poor technological infrastructure and poor small and medium enterprises support must be tackled head on. The current economic reform programme –National Economic Empowerment Development Strategy (NEEDS) appears to be a welcome development if and only if it will be implemented in such a way to get Nigeria out industrial and technological quagmire.

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