



(REVIEW ARTICLE)



## Solutions to Nigerian problems of industrialization and manufacturing

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GSC Advanced Engineering and Technology, 2021, 01(02), 049–057

Publication history: Received on 09 June 2021; revised on 29 August 2021; accepted on 31 August 2021

Article DOI: <https://doi.org/10.30574/gsaet.2021.1.2.0036>

### Abstract

Industrialization is the key for country's economic development and growth. In African, most of their government refused to fully sponsor or fund MSE's and industrialization ideologies. Their infrastructural development and economic policies are of very minimal for strong industrial development. Nigeria faces such situation and the government has refused and neglects the industrialization sectors, yet they want to be a developed country. The solution to industrialization is for the Nigerian government is to reform their economic policies, industrial policies, Develop infrastructures, promote MSEs, research and development (R and D). There is also a very significant need for the Nongovernment organizations to aid the Nation to industrialize and promote the manufacturing systems.

**Keywords:** Industrialization; Manufacturing; Small and medium scale enterprise; Research and Development; Economy

### 1. Introduction

Industry originates from French as industries or Latin as industria which means 'diligence'. However several scholars and authors have defined industry from their own perspective. Industry as defined by some scholars and authors were as follows:

dictionary.cambridge.org (2021), express industry as the companies and activities involved in the process of producing goods for sale, especially in a factory or special area (dictionary.cambridge.org, 2021). Investopedia.com (2021), defined industry as a group of companies that are related based on their primary business activities (investopedia.com, 2021). businessdictionary.com (2021), says that industry is the manufacturing or technically productive enterprises in a particular field, country, region, or economy viewed collectively, or one of these individually. It also says that industry is any general business activity or commercial enterprise that can be isolated from others, such as the tourist industry or the entertainment industry (businessdictionary.com, 2021). However, Dictionary.com, (2014), shows that Industry is the production of goods or related services within an economy. Having observed several scholars definition of industry and their views, it is now clear that industry is where there is production of goods or services within the area, region, country or an economy. Industry serves as the major source of revenue of a group or company. When a large group has multiple sources of revenue generation, it is considered to be working in different industries. Manufacturing industry became a key sector of production and labor during the Industrial Revolution, upsetting previous mercantile and feudal economies. This came through many successive rapid advances in technology. Following the Industrial Revolution, possibly a third of the world's economic output is derived that is from manufacturing industries. Many developed countries and many developing/semi-developed countries depend significantly on manufacturing industries. Industries, the countries they reside in, and the economies of those countries are interlinked in a complex web of interdependence.

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## 2. Industrial Revolution

The industrial revolution was a period lasting from the mid-18th century to the mid-19th century that saw the development and popularization of mechanized means of production as a replacement for hand production (Industrial Revolution - Facts and Summary - history.com, 2021). In Europe and North America, the industrial revolution largely leads to the abolishment of slavery (Harley, 2011).

The Industrial Revolution led to unprecedented expansion in wealth and financial wellbeing for some. It also led to increased labor specialization and allowed cities to support larger populations, motivating a rapid demographic shift. People left rural areas in large numbers, seeking potential fortunes in budding industries. The revolution quickly spread beyond Britain, with manufacturing centers being established in continental Europe and the United States (investopedia.com, 2021).

World War II created unprecedented demand for certain manufactured goods, leading to a buildup of productive capacity. After the war, reconstruction in Europe occurred alongside a massive population expansion in North America. This provided further catalysts that kept capacity utilization high and stimulated future growth of industrial activity. Innovation, specialization and wealth creation were causes and effects of industrialization in this period. The late 20th century was noteworthy for rapid industrialization in other parts of the world, notably East Asia. The Asian Tigers of Hong Kong, South Korea, Taiwan and Singapore are well known for economic growth that altered those economies. China famously experienced its own industrial revolution after moving toward a more mixed economy and away from heavy central planning (investopedia.com, 2021). Industrialization simply means the scientific and socio-economy growth of a nation that improves the standard of living of its citizen. However, Africa's industrialization dates back to 14<sup>th</sup> to 15<sup>th</sup> century Egyptian civilization (Stephen, 2018). Egypt was the first African country that step their footprint in industrialization system. They rather relied on a poor farming system that could barely feed more than three families. Although there was a resemblance of governance for most Africa state, this governance was not knowledgeable enough to drive the concept of development that will energize industrialization. However, pre – colonial state of Africa were masqueraded in peasant farming before the coming of colonial masters who divided Africa to the various region of their choice. The first industrialization that took place in Africa was on arable agricultural produce driven by the colonial commerce in exchange for slaves and cowries as a medium of exchange. At the abrogation of the slave trade by the United State Federal Law (The Act Prohibiting Importation of Slaves) in 1807 which took effect in 1808, gave Africa leverage for upward looking for the emancipation of past set-backs resulting from such continental abuse and duration imposed on Africans. African started looking up toward economic and technological empowerment at the instance of the colonial masters who came to impose their own foreign business and political ideologies. This led to another delay in the development of the continent as it were. During the colonial era, Africa under the supervision of the Western world started copy-developing in technology. That is, manual skill acquisition and educational acquisition were sold to Africans whose saw it as a new order while advance skill in technology was kept from their reach. In the area of power/energy construction and economy, Africa has moved forward fairly. These take off stage commenced short-lived after the independence of Africa Countries living Africa to inwardly drive their development process toward industrialization which has remained a solidarity movement with vest potentials on the continent to springboard if harness properly. In spite of the foregoing, Africa still remains a fertile potential continent for massive technological advancement and development if, priority is given to economic policies that will wheel growth. In a 21<sup>st</sup> century, Nigeria, South Africa, Angola and other potential African states are in the road path to industrialization. While the Western states are gradually migrating to the continent of Africa to harness their investment potential in order to advance wealth. Every country of the world had to advance their technological and economic base to be able to be called developed economy. In the same vein, it creates lots of job opportunities for their citizens. Although Africans seems to be growing in this regard, there are spirited determinations to develop in the area of technology. In late 1990s, President Obasanjo in his eight years of leadership as Nigerian President seriously created the economic platform for entrepreneurial revolution and industrialization of the economy, such as opening up of the petroleum sector to investors, deregulation of telecommunication in Nigeria that empowered small and medium scale enterprise (SMEs), job creation and social development. However, Africa is most blessed with natural and human resources that are yet to be explored as. Industrialization is a factor of science, technology discovery and entrepreneurial development. Africa has these above mentioned potentials to industrialize if only African leaders are purpose driven. The global economy is technologically and entrepreneurial driven, while the government creates an enabling environment upon which investor operates. Another booster to industrialization is adequate and constant energy supply which Most African Countries have not been able to overcome, and the theory of sentiment by African Leaders has hampered industrialization in Africa.

Despite the current investment invasion in Nigerian oil and gas sector coupled with its sectarian reform, massive drive on the resuscitation of the agricultural sector, and the giant stride taken on energy development in most African States,

when completed, it will massively generate employment that will bridge the current unemployment gap witness in the continent.

The present economy recession experience in the country is due to lack of industrial and developmental ideology that will revolutionize gains from internally generated revenue (IGR) that foreign earnings like it where in oil boom and indigenization decree of the 1970s in Nigeria. Industrialization is not only an aged form of new order rather; it is an economic engine that energizes wealth, technical skills developmental technologies and a broad to employment.

A nation is said to be underdeveloped when a larger proportion of her workable age bracket are not resourceful or gainfully engaged in economic productive labor. Africa's industrialized profile is sleeping and yet to get the height it deserves in the committee of nations. Another positive impact of industrialization on an economy is the improvement of disposable income of its citizen. This implies free-flow of wealth among citizens, it will reduce inflation /economic recession tentacles and eliminate high unemployment ratio. When Africa is able to get into industrialization (the take-off stage of economic growth), every socioeconomic and political index will automate itself into massive development. Thus, redirect our preferences and thoughts of an average African to want to create, initiate, explore, and discover to invent new frontiers that will proudly compete in the globe. In addition, the environment will attract foreign investors and eliminate imperialist capita flight to other continents.

Industrialization will enhance modern challenges such as a change in lifestyle, educational improvement, improvement in medical services, urbanized transportation system, improve the living standard and energizes small and medium scale enterprises (SMEs), which is the hallmark for socioeconomic advancement (Stephen, 2018).

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### 3. Industrial development

The Industrial Revolution led to the development of factories for large-scale production with consequent changes in society (*More, 2000*). Originally the factories were steam-powered, but later transitioned to electricity once an electrical grid was developed. The mechanized assembly line was introduced to assemble parts in a repeatable fashion, with individual workers performing specific steps during the process. This led to significant increases in efficiency, lowering the cost of the end process. Later automation was increasingly used to replace human operators. This process has accelerated with the development of the computer and the robot.

#### 3.1. Industrialization and Its Characteristics

Industrialization is the period of social and economic change that transforms a human group from an agrarian society into an industrial society, involving the extensive re-organization of an economy for the purpose of manufacturing (*O'Sullivan and Sheffrin, 2003*). Industrialization is part of a process where people adopt easier and cheaper ways to make things.



**Figure 1** Samples of Industrialization

Using better technology, it becomes possible to produce more goods in a shorter amount of time. More things can be produced by fewer people (*Maddison, 2007*). As industrial workers' incomes rise, markets for consumer goods and services of all kinds tend to expand and provide a further stimulus to industrial investment and economic growth

(O'Sullivan and *Sheffrin*, 2003). Characteristics of industrialization include economic growth, more efficient division of labor, and the use of technological innovation to solve problems as opposed to dependency on conditions outside human control (investopedia.com, 2021).

### 3.2. Industry Life Cycle

Industries experience a similar cycle of life. Just as a person is born, grows, matures, and eventually experiences decline and ultimately death, so too do industries and product lines. The stages are the same for all industries, yet every industry will experience these stages differently, they will last longer for some and pass quickly for others (Hitt et al, 2001). Even within the same industry, various firms may be at different life cycle stages. A firm's strategic plan is likely to be greatly influenced by the stage in the life cycle at which the firm finds it. Some companies or even industries find new uses for declining products, thus extending their life cycle (Porter, 1991).

The growth of an industry's sales over time is used to chart the life cycle. The distinct stages of an industry life cycle are: introduction, growth, maturity, and decline. Sales typically begin slowly at the introduction phase, and then take off rapidly during the growth phase. After leveling out at maturity, sales then begin a gradual decline. In contrast, profits generally continue to increase throughout the life cycle, as companies in an industry take advantage of expertise and economies of scale and scope to reduce unit costs over time (Wang, 2006).

Stages of the life cycle are; Introduction, growth, maturity and decline. In the stages of industrial life cycle is where the industrial problems lay. In Nigeria, there are several problems of industrialization and industrial system which are as follows; lack of constant energy generation, lack of capital, deficiency in manpower training, lack of credit to industrialists, industrial policies, lack of basic infrastructural amenities, lack of social security, Ethnicity problems, terrorism problems, environmental hazards, environmental pollutions, lack of research and development funds for industrial growth and only to mention but a few. If the problems of industrial sectors can be addressed, the industrial life cycle will prolong (Wansink and Gilmore, 1999).

In this study, the researcher tends to focus on means and solution to only two major industrial problems.

### 3.3. Industrialization Problems and Solutions

In Nigeria, the two major Industrial Problems that eat deep in manufacturing and industrializations are;

- Energy
- Capital
- Government Policies
- Research and Development

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## 4. Energy Generation or Power Generation

This is one of the major problem of industries and industrialization in Nigeria since the ages and existence of the country. Lack of adequate power or energy generation in the Country has back slides, stopped and eliminates several Public Liability Companies and small and Medium Scale Industries. It has also radically diminished the existence of several industries and industrialization of Nigeria as a Country. Improper energy generated and distributed in the Country influence significantly the existing Industries productivity, increase their material wastes and causes frequent damage of their industrial machines due to lack of constant supply of the energy generated. These problems cause the industries to run at a very high risk and high cost to manufacture any goods which however, influence the marketability of the products and services of the industries. It also involves more financial power and labor force to run the industrial system in the country. This is a serious negative effect to any country's economic growth and development. It makes the economic growth very slow and causes more unemployment to the people due to deficiencies in industrialization and industrial growth and its development. The energy sector in any country cannot be played with if any country wants to grow and develop their economy.

Having observed the negative effect of lack of constant energy generation and distribution in the industrial system in Nigeria, the researcher recommends several solution or ways to make amend to ensure a suitable power generation to industries to appraise industrialization growth in the Country.

#### **4.1. Solution to Energy Generation for Industrial Use**

The industries are firstly tasked with their feasibility studies. A detailed and well-designed feasibility studies will aid the industry or industries to understand the best location for their industrialization activities. It will help to recommend the best alternative energy generation to be adopted in the industry and the best location or source to harness the energy for industrial usage and consumption.

Industries must not depend solely on Nigerian energy generation; there is need to device for a means to source for alternative source of energy or power.

In industrialization, industries should consider having there mini hydropower generation source for their industrial consumption. Furthermore, a mini hydro energy system can help the industries to ensure a steady power generation to ensure constant use of energy.

Solar Energy generation which is the third best energy generation in the world can also be adopted for use in industries.

Biofuel can however, still serve as alternative to energy generation in the industries power generation system. It's a recycling process of bio material as an alternative to energy generation for industrialization usage. It is a very nice source of energy generated using bio materials. Biomaterials are degradable material.

Wind energy generation system is also a means of energy generation which can be generated for industrialization and for industries usage. Industries can also use wind energy generation as an alternative to Nigerian power generation system. It's an excellent source of energy generation that can take very good care of industries power usage.

Introduction of turbines as a means of generating energy in the industrial sectors will eliminate the problem of insufficient energy generation in the industrial system. It can be a means of the industries to generate capital for the industrial system. If they wish to generate more energy that can serve more than their industrial sector. The industry can distribute the energy within its locality to generate some financial investment to their industrial system.

Introduction of nuclear energy generation is also a means of generating energy in the industrial sectors. If the industries can have the financial muscle to establish the nuclear energy system, it will eliminate the problem of industrial energy generation and its effects and consequences of constant power or energy failure in the industrial system and promotes continuous improvement in the industrial sectors. It will also help to produce the best goods from the industries and gives a smooth running and the efficiency of the industrial products will improve. This will be a boost to the industries and it will help the industries to compete in the market.

The energy generation will encourage industrialization of mass production of goods. This requires more labor to achieve. And so would lead to employment of capable hands in the production process. However, as the country industrialize; more people would be employed to keep up with the production rate.

As employment is generated, the number of unemployed reduces. This goes to reduce poverty in the country. However, it will increase industrial output means that the masses now have variety of goods to choose from at affordable prices. This equally goes to improve the living standards of the populace.

Industrialization leads massive production of goods. Some of these goods may not be needed for local consumption. Thus, they are exported. This generates foreign exchange for the country, improve the countries balance of payment and ultimately stimulate economic growth. Also, it leads to the conservation of foreign exchange. Funds that would have been used to purchase foreign goods are reserved, since such goods are made locally.

The establishment of energy generation will bring about the growth of the industrial sector will also help to stimulate the growth of other sectors.

As a country industrialize, more people are trained in different managerial technical areas to acquire knowledge needed in managing the firms and machines. This improves the knowledge base of the country.

The establishment of energy generation system in industries weather mini energy generation or mega energy generation system to serve any industry or industries will always bring a significance improvement to the industrial system. It will help the industry to grow faster, eliminate excess wastes and promote continuous improvement of the industrial system. It will prolong the life cycle of the industrial sectors, helps to develop several manpower in the

industrialization system. It will promote the economic growth and development of the industries. Energy generation by the industries will help to reduce unemployment in the country and also helps the industries to easily simulate the growth of their similar sectors in the industrial system.

#### **4.2. Capitalization of Industrial Sectors**

In industries one of the major problems of any industry is the finance or the capital to establish and run the company smoothly. It has stopped several Industries, bankrupt some industries and it has never allowed several other industries especially small and medium scale industries to exist. However, in Nigeria, access to industrial loans from the Federal Government and the Non-Governmental Organizations in the country is almost impossible due to the Nigerian system of Government, too much corruption in the system, as man know man in the system and ethnicity problems in the Country.

Lack of capital in the industrial system leads to lack of basic infrastructures in the system and in the country.

The high rate of the country's exchange fluctuation eats deep to industrial financial power or capital and influence the industrial productivity in a high negative way.

However, deficiencies of capital to industrialization or the industrial system in the Country has leads to the Country's diminish to economic growth and development of the Country. This leads to high rate of unemployment to the society, lack of manpower training, lack of basic infrastructures, lack of social activities and social security, lack of entertainment and deficiencies in labor force and productivity rate in the industrial system.

There is an urgent need to optimize the problem of capital in industrial system because it is the life wire of industrialization and always a life wire to the growth and development of any Country's economy.

#### **4.3. Solution to Capital for Industrial Sectors**

Loans from Federal Government (FG) and Non-Governmental Organizations (NGO's)

Federal Government should make access to industrial loans very easy and simple especially for the small and medium scale industries in the Country without the influence of corruption or as man know man or even ethnicity in the process of collecting the industrial loans. Process and methods of collecting the industrial loans should be advertised to the public for the awareness of the public. Industries will be trained on how to obtain the Federal Government industrial loans and they should also help the industries in acquiring the loans.

The industrial loan should have a very low interest rate that can be affordable to the newly existing industries and already existing industries for the growth of industrialization and the economy of the country.

The federal Government should form an ally with the industrialization sectors and also encourage the existence of small and medium scale industries in the Country.

Non-Governmental Organizations (NGO's), like the World Bank, International Monetary Fund (IMF) and others should also form an ally with the industrial sectors for monetary funding of the industries. A means of assessing the Non-Governmental Organizations loans should be made public to the industrial system and the Nigerian Government also has a role to play in other to ensure that the industrial sectors has an easy access to the Non-Governmental Organizations loans. This will be a means to grow the industrial sectors within the Country.

The Nigerian Government should develop a means of stabilizing the country's exchange rate for the industrial sectors. This will help the industries to ensure just in time production and with the expected cost of production. It will help the industries to coordinate their daily production activities without any financial turbulence in the production of their goods and purchasing of their raw materials within and outside the Country.

The government and the industries should work towards improving the manpower training system in industrialization system. Technical courses should be introduced into the manpower training curriculum, with more emphasis on practical than theories. Industrial sectors can also adopt the strategy of sponsoring eligible students to go to more technologically advanced countries to acquire technical knowledge that would be invaluable to the country.

Government should make policies favorable to the capital improvement of industrial sectors. Policies like tax holidays, excise duty reduction and tariff protection. Government should also grant special loans to encourage export of locally made goods to help the industrialization sectors to improve their financial power.

The government should provide adequate infrastructure like electricity, good road network, a perfect rail way system round the nation and water transport facilities, improved communication infrastructures and promotes any means of basic infrastructures development by any industry and beyond. All these would facilitate the production and movement of goods within and outside the country. It will help the growth of the industrialization capital and the growth of the economy.

Government should minimize the constant change of economic policies. Adequate measures should be employed to tackle the security problems in various regions of the country, especially, the Boko Haram insurgence in the North. The problem of militancy should urgently address. The problem of Fulani's herdsmen should be addressed urgently.

Government and the industrial sectors should form allies for the improvement of industrial capitalization which will lead to the growth and development of industrialization in the Country. When the capitalization of industrial sector has grown, the Federal Government and the Non-Governmental Organizations assist in industrial loans by making it easier, affordable and less interest rate to the industrialists, the economy of the Country will grow. If it can be achieved it will lead to massive employment to the masses, availability of basic infrastructural amenities, enhancement of entertainment industries, improvement of social activities and social security, growth and development of the country's economy.

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## 5. Government Economic Policies

Government policies and its economic policies are some of the serious minded policies that influence the industrialization and manufacturing systems of the country. The government has no enhanced and modern policies that will appraise the industrial policies of the country. The government often allows the monopoly of a business because of ethnic or religious or selfish interests.

### 5.1. Solution to Government Economic Policies for Industrialization

Economic Policy is a government policy that reflects the rules and regulations for how the economy will operate is referred to as economic policy. Introducing the gold standard and eliminating the silver standard was one form of economic policy.

Industrial Policy is the strategic effort by the state to encourage the development and growth of a sector of the economy.

Technology policy is a form of 'active industrial policy', and effectively argues, based on the empirical facts of technological development as observed across various societies, industries and time periods, that markets rarely decide industrial fortunes in and of their own and state-intervention or support is required to overcome standard cases of market-failure.

The activation of these policies to its full force ensures the growth and development of industrialization in the country.

There are some other government bodies that create policies and laws that govern industrialization, they include:

**Antitrust law:** Antitrust law is the broad category of federal and state laws that are meant to keep business operating honest and fairly. Antitrust laws can also be defined as regulations that monitor the distribution of economic power in business, making sure that healthy competition is allowed to flourish and economies can grow. Antitrust law ensures that there is no monopoly in industrialization and it encourages competitiveness to enhance and promotes productivity and economy.

**Patent:** A patent is a grant of protection for an invention given by the government. However, government should encourage inventors to patent their product and help in commercializing the product for public utility. Furthermore, the government should consider and reconsider the inventors that can't afford to patent the products before commercialization and also support the inventors to patent and to commercialize the products.

**Copyright:** Copyright is the exclusive right given to the creator of a creative work to reproduce the work, usually for a limited time. The essence of such right is to encourage the industrialist or the producer to reap the dividend of its work.

These policies govern by the government bodies helps to grow and develop the economy through industrialization and manufacturing.

## 5.2. Research and Development

Deficiencies and lack of encouragement in research and development by the industrialization sectors and government degrade the industrialization sectors and manufacturing systems and also the country's economy.

## 5.3. Solution to Research and Development for Industrialization

Government should encourage research and development which is the key to inventions and creation of new products for productivity. Government should encourage industrialization sectors, manufacturing systems and other economic sectors to partner with research and development centers and research and development institutions to encourage best and optimization of industrial utilities and manufacturing systems. Research and development will enhance products continuous improvement. It will ensure invention and creations of new industrial utilities and manufacturing systems. Research and development is the key to industrial revolution and economic growth and development. Governments should create research and development centers and encourage the public to participate in the research. Government and industrial sectors should encourage institutions in building and promoting research and development in the country. The growth and development of the industrial systems and industrial sectors is the growth and development of the country and its economy. Finally, the Nigerian Government should be highly mindful of the industrial capitalization, for improvement of industrialization system financially is the improvement and growth of the Country's economy.

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## 6. Conclusion

In conclusion, why Africa in particularly Nigeria is still under developed is because of lack of industrialization. Why China, some other part of Asia and some other part of the world are developing countries is because of their growth in industrialization. For every nation to grow their economy, their industrialization needs to grow. This is why any nation should be very mindful of the country's industrialization and take it more serious than ever. Nigerian Government should collaborate with some financial institutions and some financial Non-Governmental Organizations to urgently address the problem of industrial sectors especially the energy generation (or electricity generation) which is very crucial to industrial growth and capitalization of the nation's industrialization. If these two major problems are addressed, the nation's industrialization and the nation's economy will have a rapid growth and development in few years to come.

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## Compliance with ethical standards

### *Acknowledgments*

The authors wish to acknowledge themselves for all their efforts towards accomplishment of this research work. The study was self-sponsored.

### *Disclosure of conflict of interest*

There is no conflict of interest in this study.

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