

**ETHICAL EVALUATION OF THE HISTORICAL IMPERATIVES OF SCIENCE  
AND TECHNIQUES IN THE DEVELOPMENT OF SMALL AND BIG SCALE  
INDUSTRIES IN CONTEMPORARY NIGERIA**

**BY**

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**Abstract**

*This research is motivated by the wonderful contributions of Science and Technology. Science and Technology have continued to engineer progress in human life. One of the remarkable ways science and technology have been employed and was to facilitate industrialization in the 18<sup>th</sup> Century Britain in Europe. The industrial expansion was facilitated by the ground breaking of Science and technology which led to industrial boom in the manufacturing of goods and production of services. Science and Technology in the world including Africa is an age long phenomenon. While, Science is the systematic study of anything that can be examined, tested, and verified, it is one of the greatest and most influential fields of human endeavor. Technology on the other hand, is scientific knowledge that is put to practical ends. This knowledge is used in designing machinery, materials, and industrial processes, generally known as engineering. The concern of this paper is that in recent years, a greater volume of African countries have embraced the western science and technology as a driver of development assimilating African science and technology as though there was nothing like that before. This work is interested in helpful materials to explore the previous African concept of science and technology. Based on its finding, it is discovered that Africans appear to have abandoned their rich indigenous science and technology which has unfolded over the centuries since the dawn of human history like the western science and technology today. The work advanced the need for Africans to revitalize their lost heritage to complement the scientific culture of the west.*

## **Introduction**

The historical development of man from the earliest to the present civilization has been the history of constant struggles towards improving wellbeing pursued differently at each stage in history. Modern scientific discoveries can be said to have become a new hope towards the exploration of potentials for the good of human being.

Indeed, science and technology have continued to engineer progress in human life. It became an important vehicle for the 18<sup>th</sup> Century industrialization process in Britain and in Europe. The industrial expansion was facilitated by the ground breaking of Science and technology which led to industrial boom in the manufacturing of goods and production of services. Britain won the attraction of other countries of the world that found in it the new secret of improvement that industrialization born by science and technology brought in a better life which opened the door for proliferation and spread of industries across nations establishing fertile ground for building a viable and sustainable economy. The problem of poor industrial ethos with apparent poor maintenance and management culture in Nigeria for instance, has affected and grounded machines in many of the industries both small and large scale, public and private in the past three decades. For instance, the numerous vibrant industries such as Kaduna Peugeot Car Assembly, Ajaokuta Steel Complex, Benue Cement Company, Gboko, Ashaka Cement, Arewa Textile, Kaduna and Jos Steel Rolling Mill, Savannah Sugar Company in Bauchi have gone into coma. The Nigerian railway corporation, Nigerian airways, the agricultural industry and some state-owned transport companies like the Nasarawa State “On the Move”, no longer function as expected. While, the Nigerian National Petroleum

Corporation (NNPC) and refineries at a point in time assumed epileptic function, In fact, even the government policy of privatization has not been able to adequately solve the problem. These failures are essentially tied to unethical behaviours like greed, looting and embezzlement of public funds, poor maintenance culture and lack of patriotism.

The concern of this paper is to help close these ethical gaps that have retarded our desired scientific knowledge and techniques for sustainable industrial development in both small and large scales in Nigeria. The paper attempts to address the following compelling issues: the conditions that favoured industrial revolution as it applies to Nigeria, factors responsible for distorted industrial attempts in Nigeria, the role of ethics to revitalize collapsed industries in Nigeria. It shall provide a panacea for moral transformation and implementation that would advocate for stability of science innovation and a sustainable industrial development in Nigeria.

### **Clarification of Concepts**

**Development:** Development is a concept that features in many fields of human endeavours. Thus, it is a multi-dimensional process that could be seen from many perspectives ranging from human to social, cultural and economic wellbeing of the people. For Adejumo (2013), development is advancement from a low level to a higher level of political, social, and economic, scientific and technological maturity.<sup>1</sup> This work describes development to entail, the general improvement in the wellbeing of society that touches all dimensions of life.

**Industry:** An industry is a classification that refers to groups of companies that are related based on their primary business activities. It is a term used to refer to the production of goods or services within an economy. The production side of business

activity is referred to as industry. It is a business activity which is related to the raising, producing, processing or manufacturing of products.<sup>2</sup> This is the understanding of industry that this work adopts.

**Morality and Ethical:** Morality is derived from the Latin word, *moralis* which means custom or habit. According to Anjov and Nguemo (2016), Morality refers to “any set of norms or standards that define, guide and regulate good or acceptable behaviour among human beings living together in society”.<sup>3</sup> This is the understanding of morality that this work adopts. It will be used interchangeably with ethics. Thus, ethical or moral paradigm within the context of this work refers to the acceptable set of norms that should be adopted to make industrialization a success in Nigeria.

**Revolution:** Revolution is a term that is used in different contexts. Yoder (1926) gives the meaning of the concept revolution as; “a change so drastic as to involve all phases of social organization”.<sup>4</sup> It is a drastic change in the ways of doing things such as thinking and methods of doing things.

**Science:** The word science is derived from the Latin word *scire*, meaning “to know.” Science is the systematic study of anything that can be examined, tested, and verified. From its early beginnings, science has developed into one of the greatest and most influential fields of human endeavor. Today different branches of science investigate almost everything that can be observed or detected, and science as a whole shapes the way we understand the universe, our planet, ourselves, and other living things. Science develops through objective analysis, instead of through personal belief. Knowledge gained in science accumulates as time goes by, building on work performed earlier. Some of this knowledge such as our understanding of numbers stretches back to the time of ancient civilizations, when scientific thought first began. Other scientific

knowledge such as our understanding of genes that cause cancer or of quarks (the smallest known building block of matter) dates back less than 50 years. However, in all fields of science, old or new, researchers use the same systematic approach, known as the scientific method, to add to what is known.<sup>5</sup>

**Technology:** Technology is scientific knowledge that is put to practical ends. This knowledge comes chiefly from mathematics and the physical sciences, and it is used in designing machinery, materials, and industrial processes. In general, this work is known as engineering, a word dating back to the early days of the Industrial Revolution, when an 'engine' was any kind of machine.<sup>6</sup>

### **Historical Development and Successes Made in Science and Technology in Ancient Africa**

Despite suffering through the horrific system of slavery, early Africans made countless contributions to science and technology.<sup>7</sup> Unfortunately, many people are unaware of these accomplishments, as part of the history of Africa, beyond ancient Egypt, as is seldom publicized. In as much as a number of discussions that have taken place in various quarters concerning the origins of science and technology mostly mentioned and concentrated only on the Greeks, Romans and other countries in the west. Nevertheless, it is also important to put on record that, many of the discoveries of those science and technology took place thousands of years ago in Africa and therefore came from African civilizations and developments. For instance, while the remarkable black civilization in Egypt remains alluring, there were sophisticated and impressive inventions

throughout ancient sub-Saharan Africa as well. This alludes to the fact of what Ivan Van Sertima (2013), once wrote that “the nerve of the world has been deadened for centuries to the vibrations of African genius”.<sup>8</sup>

African indigenous science and technology like that of the west has unfolded since the dawn of human history. According to Shishima (2012), the evidence of tools used by African ancestors is interred in valleys across Sub-Saharan Africa. This reality translates to what we see in recent years, where a greater volume of African countries have embraced technology as the driver of development, one example is that of Nigeria’s vision 2020, Kenya's Vision 2030 and Rwanda's rapid Information and Computer Technology (ICT) growth.<sup>9</sup>

Corroborating, Shillington (2013), explains that, modern man first developed in the Great Rift Valley of Africa, the first development of tools were found there as well: The *Homo habilis*, residing in East Africa, developed the first tool making industry, the *Olduwan*, around 2.3 million BC. *Homo ergaster* developed the *Acheulean* stone tool industry, specifically hand-axes, in Africa, in around 1.5 million BC.<sup>10</sup> The *Homo ergaster* roughly translates to "[working](#) man", referring to the more advanced tools used by the species in comparison to those of their ancestors. The fossil range of *H. ergaster* mainly covers the period of 1.8 to 1.7 million years ago, with a handful of older and younger specimens extending the range to about 2 and 1.5 million years ago respectively. Though fossils are known from across East and Southern Africa, most *H. ergaster* fossils have been found along the shores of Lake Turkana in Kenya. There are later African

fossils, some younger than 1 million years ago, that indicate long-term anatomical continuity. This tool industry spread to the Middle East and Europe around 800,000 to 600,000 BC. Homo erectus began to use fire. Homo sapiens or modern humans created bone tools and the back blade around 90,000 to 60,000 BC, in Southern and Eastern Africa. The use of bone tools and back blades became characteristic of later stone tool industries.<sup>11</sup> It was during this period that the appearance of abstract art also took place. The oldest abstract art in the world is a shell necklace dated 82,000 years found in the Cave of Pigeons in Taforalt, eastern Morocco. The second oldest abstract art and the oldest rock art was found in the Blombos Cave at the cape in South Africa, dated 77,000 years.<sup>12</sup> These are indicators that Africa, like other ancient civilizations in the world, definitely had their brains. Some of the great achievements in different human endeavors of ancient African are treated here in turn:

**Mathematics:** It is worthy of note that only a few people are aware, that many modern high-school-level concepts in mathematics were first developed in Africa, as it was the first method of counting. More than 35,000 years ago, Egyptians scripted textbooks about mathematics that included division and multiplication of fractions and geometric formulas to calculate the area and volume of shapes.<sup>13</sup>

**Astronomy:** In the field of Astronomy, several ancient African cultures made meaningful discoveries. Many of these are foundations on which we still rely, and some were so advanced that their mode of discovery still cannot be understood. Egyptians charted the movement of the sun and constellations and cycles of the moon. They divided the year

into 12 parts and developed a year long calendar system containing 365 ¼ days. Clocks were made with moving water and sundial-like clocks were used. A structure known as the African Stonehenge in present-day Kenya (constructed around 300 B.C.) was a remarkably accurate calendar.

**Navigation:** The general belief by most people is that Europeans were the first to sail boats to the Americas. However, several lines of historical evidence suggest that ancient Africans sailed to South America and Asia hundreds of years before Europeans. Africa built a variety of boats with many cabins and cooking facilities. The Malians and Songhai built boats 100 feet long and 13 feet wide that could carry weight of up to 80 tons load.

**Learning systems:** Learning systems too began in Africa long before the coming of the European explorers. In about 295 BC, the Library of Alexandria was founded in Egypt. It was considered the largest library in the classical world. Al-Azhar University, founded in 970-972 was the chief centre of Arabic literature and Sunni Islamic learning in the world. The oldest degree awarding university in Egypt after the Cairo University was established in about 961 when non-religious subjects were added to its curriculum .<sup>17</sup> Three philosophical schools in Mali existed during her golden age around 12th–16th centuries. They are: University of Sankore, which was capable of housing 25,000 students and had one of the largest libraries in the world with roughly, 1000,000 manuscripts, Sidi Yahya University etc. Mansa Musa's Sankoré University became full flaged with the largest collections of books on African science. Timbuktu was a major center of book copying, religious groups, sciences, and arts. Scholars and students came throughout the world to



study in this university. It attracted more foreign students than the New York University today.<sup>14</sup>

**Metallurgy and tools:** Many advances in metallurgy and tool making were made across the entirety of ancient Africa. These include steam engines, metal chisels and saws, copper and iron tools and weapons, nails, glue, carbon steel and bronze weapons and art. Advances in Tanzania, Rwanda and Uganda between 1,500 and 2,000 years ago surpassed those of Europeans then and were astonishing to Europeans when they learnt of them. Ancient Tanzanian furnaces could reach 1,800°C -200 to 400°C warmer than those of the Romans. Most of Sub-Saharan Africa moved from the Stone Age to the Iron Age. When gold sources were depleted in the Sahel, the empires turned to trade with the Ashante Kingdom. Similarly, The Swahili traders in East Africa were major suppliers of gold to Asia through the Red Sea and Indian Ocean trade routes.<sup>15</sup>

**Medicine:** Many treatments we use today were employed by several ancient peoples throughout Africa. Before the European invasion of Africa, medicine in what is now Egypt, Nigeria, South Africa and Ghana, were more advanced than medicine in Europe. Salicylic acid was used (as in aspirin) for pain, kaolin (as in Kaopectate) for diarrhoea, and extracts that were confirmed in the 20th century to kill Gram positive bacteria. Other plants used had anticancer properties, caused abortion and treated malaria and these have been shown to be as effective as many modern-day Western treatments. Medical procedures performed in ancient Africa before Europe include vaccination, autopsy, limb traction and broken bone setting, bullet removal, brain surgery, skin grafting, filling of

dental cavities, installation of false teeth, delivery through what is now known as Caesarean section, anesthetic and tissue cauterization. Medical papyri show empirical knowledge of anatomy, injuries, and practical treatments. Wounds were treated by bandaging with raw meat, white linen, sutures, nets, pads and swabs were soaked with honey to prevent infection, while opium was used to relieve pain. Garlic and onions were used regularly to promote good health and were thought to relieve asthma symptoms. In 1285, the largest hospital of the Middle Age and pre-modern era was built in Cairo, Egypt, by Sultan Qalaun al-Mansur. Tetracycline was being used by Nubians, based on bone remains between 350 AD and 550 AD.<sup>16</sup>

**Trade and Commerce:** The Ghana Empire, Mali Empire, and Songhay Empire were major exporters of gold, iron, tin, slaves, spears, javelin, arrows, bows and whips of hippo hide. They imported salt, horses, wheat, raisins, cowries, copper, henna (colorants), olives, tanned hides, silk, cloth, brocade, Venetian pearls, mirrors, and tobacco. Some of the currencies used in the Sahel are as follows: 1. Paper debt or IOU's were used for long distance trade. 2. Gold coins were also in use. 3. The *mitkal* (gold dust) currency was also in use. The equivalent of gold dust that weighed 4.6 grams equals 500 or 3,000 cowries. 4. Square cloth, four spans on each side, called *chigguiya* was used around the Senegal River. In Kanem Borno, a cloth currency called *dandi* was in widespread use as the major currency.<sup>17</sup>

From the foregoing, we see that, African indigenous science and technology evolved from within the African indigenous creative expression of their knowledge of and from the divine. The evolution of African indigenous science and technology is

aboriginal, foundational. Therefore, rather than discarding our rich science and technological culture, we need to invigorate, encourage and sustain it.

### **The Development of Industries in Nigeria Successes and Challenges**

Although different scholarships have drawn this history from divergent angles, the history of industrialization in Nigeria dates back to the nineteenth (19<sup>th</sup>) century prior to its independence. According to Dagogo (2014), this history exists in the following phases:

- i. The Pre-Independence Era (1943-1959):** This period of Nigeria featured considerable craft industries involving artifacts of wood, brass and bronze, leather, textiles, iron works, pottery, canoe carvings, bronze works, and embroidery. These industries featured at close proximity with the available raw materials, and following the superior competition of the factory system of production, they declined, particularly, as the motive of the imperial government was to obtain industrial raw materials from the country.
- ii. Immediate Post-Colonial Era (1960-1969):** This period was remarkable for the emergence of the First National Development Plan between 1962 and 1968. It was in this period that Import Substitution Strategy began, which gave room for local manufacture of goods that were previously imported. The advantages of this new strategy were to lessen over-dependence on foreign goods, and to save foreign exchange by producing those goods locally. As part of the benefits of this strategy, most small, medium, and large-scaled enterprises were producers of food, beverages, tobacco, textiles, wearing apparels, plastics, rubber products, soap, detergents, metal products and leather products. Consequently, the consumer goods industries dominated manufacturing activities and accounted for between 70 and 75 percent of value-added and employment in the manufacturing sector, respectively. All of these successes were recorded because the industrial

policy was highly protective of the local industries with low tariff on imported inputs and high tariff on exported finished goods. Evidently, the medium and large-scale industrial plants in Nigeria increased from 150 plants at independence to 380 by 1965. Similarly, the manufacturing machines increased the share of GDP from 4.2 percent at independence to 6.1 percent in 1964.<sup>18</sup>

- iii. The Era of Oil Boom:** The spoils of the Civil War left so much to be done in terms of reconciliation, rehabilitation and reconstructing government policy towards effective industrial development. In view of this, the Second National Development Plan between 1970 and 1974 emerged. This plan had a number of objectives locked behind it, namely, to promote even development and fair distribution of industries in all parts of the country, to ensure rapid expansion and diversification of the industrial sector, to increase incomes realized from manufacturing activities, to create more employment opportunities, to promote the establishment of heavy industries in strategic sectors that could earn foreign exchange, to continue the programme of Import Substitution, to initiate indigenous manpower development schemes in the industrial sector and to raise the proportion of indigenous ownership of industrial investments. These robust objectives were considered achievable following the sufficient revenue that came with the oil boom that rocked Nigeria within this period. These industries include: oil refineries, petrochemicals, liquefied natural gas, fertilizer, machine tools, aluminum smelting, textiles, iron and steel and motor assemblies. The greatest development of the Oil Boom period was, perhaps, the introduction of the indigenization policy as contained in the Nigerian Enterprises Promotion Decree of 1972, which reserved certain categories of industrial activities, mostly services and manufacturing, for Nigerians.
- iv. The Decade of the 1980s:** Following the challenges that rocked the Nigerian economy following the failure to attain the objectives of the preceding industrial

policy, it was clear that fundamental changes needed to be made to turn things around. It was from this background that the Structural Adjustment Programme (SAP) was initiated in 1986 by the then Military President General Ibrahim Babangida. It was designed as a package of economic adjustment to last for two years, and for the industrial sector particularly, it was, to among other things, encourage the use of local raw materials and intermediate inputs, encourage the development of local technology, assist in maximizing the growth of value-added of manufacturing activity, promote export orientation, generate employment through active private sector participation, remove constraints that hamper industrial development including deficiencies in infrastructures, manpower and administration, and liberalize controls to facilitate indigenous and foreign investment. The target of SAP was to build a competitive economy. Thus, privatization and liberalization of aspects of economic activity were pursued, while the import licensing regime was abolished.<sup>19</sup>

- v. **1990 and Beyond:** This period witnessed government's effort to consolidate the gains of SAP leading to the adoption of National Rolling Plans beginning with 1990-1992 Rolling Plan which incorporated Industrial Master Plan (IMP) designed to address the shortage of industrial raw materials and inputs, infrastructure challenges, inadequate linkage among industrial subsectors, and administrative and institutional problems. Secondly, the Rolling Plan was instrumental to the pursuit of privatization of public enterprises undertaken by the Technical Committee on Privatization and Commercialization (TCPC). Thirdly, there was a deliberate policy to grow and support small scale industries particularly for their roles in furthering forward and backward linkages. Other efforts include the establishment of industrial estates and Entrepreneurial Development Programmes (EDP). According to the Federal Ministry of Industry & Technology cited in Dagogo, the aim was to develop a corps of entrepreneurs

needed for successful implementation of the small scale industrialization strategy. In 2003, the Federal Ministry of Industry released a new industrial policy with the overriding objective of accelerating the pace of industrial development by radically increasing value-added at every stage of the value-chain, as government pursued knowledge and skill intensive production on the basis of available best practices.<sup>19</sup> Unfortunately, this success story did not last long for a number of reasons. The supports in the form of tariff and quota protection were accompanied by limited discipline to the effect that it encouraged the continued concentration on the same low technology light consumer goods industries. Again, the domestic goods failed to compete with imported goods in terms of quality, innovation, delivery, and even cost in spite of the various incentives. This was largely attributed to gross inefficiency and supply bottlenecks in the management and utilization of inputs. In the light of the above, the First National Development Plan did not achieve much given that its objectives were not strictly implemented.

### **Factors Suitable for Location and Localization of Industries in Nigeria**

Everywhere in the world, the location and localization of industries are influenced by a number of factors. Nigeria lacks none of these factors:

- a. Geographical Location:** Nigeria's location on the West Coast of Africa is nearer to both the European Union (EU) and the United States (US) for the delivery of goods than the Far East countries. Cargo vessels from Nigeria take about 12days to EU and over 15days from Far East countries. Industries located in Nigeria are able to deliver components faster and cheaper to EU. Nigeria has a large landmass (31<sup>st</sup> largest in the world: about 924 thousand sq km). This landmass suggests potential of agriculture and forest resources.

- b. The Population:** Nigeria has a large population which guarantees a large market for all types of goods. The evidence of a growing market as a result of a large population makes Nigeria a fertile ground for industrialization. Apart from providing a large market, the large population makes available the required personnel to meet the labour needs of industrialization.
- c. The System of Government:** Even though, Nigeria did not have a smooth democratic run of government since after the early years of independence in 1960, the stable democratic run of government from 1999 till date has given it an industrial advantage. This system of government in the country appears to be truncated by all sorts of insecurity but unfortunately, is an attraction for foreign investors to set up industries in Nigeria.
- d. High Literacy Level:** Nigeria relatively, has, a high literacy rating level which exceeds that of many less-developed countries in the world. This implies that Nigerians can engage with foreign investors comfortably. Apart from being an advantage to Nigerians in dealings with investors, the literacy level also translates to the fact that Nigerians can set up enterprises anywhere in the world. The ability of many Nigerians to speak languages such as German, French, Spanish, Arabic and so on makes it easier for them to engage with other worlds for business.<sup>20</sup>
- e. Endemic Entrepreneurial Ability of Nigerians:** Many Nigerians are blessed with the resources in full to start-up all sorts of businesses. In many parts of Nigeria, industrial productions activities exist which indicates the potential of industrialization. Nigerians are gifted with entrepreneurial skills needed to set-up modern projects.
- f. Democratic Governance:** The transition from a military government to a democratic government is a plus to industrialization in Nigeria. This constitutes an attraction to investors to set up industries and allow for policies favourable to industrialization. There would be a hand full of advantages on Economic

Development in Nigeria ranging from quality paying jobs, high and relatively stable income generation and significant capital accumulation which enhances economic productivity, investments, both domestic and foreign as well as increase in revenue collection.

It is clear from above that, with the right strategies, industrialization can boost the capacity of countries to sustain their growth as it provides opportunities to address development challenges, such as unemployment, poverty and inequality, both in the short, medium and long-term. Nigeria can do its economy a whole lot of good when it is pursued ethically and seriously.

### **Ethical Imperatives for Sustainable Industrial Development in Nigeria**

Unless good work ethics is encouraged in the industrial sector in Nigeria, there will be no hope of any headway or success. For successful and sustainable industrial development in Nigeria, the following points should be observed strictly:

- i. Effective Governance:** Effective governance is the key to sustainable development in Nigeria. The success or failure of every industrial effort is dependent on the nature of governance involved. A society with visionary leaders that can discharge their responsibilities effectively has the guarantee of garnering industrial success. Nigeria is in dire need of visionary leaders who are well-equipped in the art of governance. Such leaders would be able to manage and effectively utilise the industrial opportunities that exist in the Nigerian polity. This implies that such leaders must possess distinctive qualities of selflessness, sacrifice, integrity, wisdom and the like that would make them effectively manage Nigeria's industrial fortunes.
- ii. Improved Manpower:** Effective industrialization in Nigeria will remain a mirage when there is no improved manpower. Those who occupy the



industrial sector must be competent hands with the technical *knowhow* and *know why*. Adejumo et al (2013) emphasize this important aspect under the umbrella of human capital development when they underscore: ...the development of the industrial sector, which is central to industrialization, will involve the use of skilled personnel, extensive technology innovative management techniques, and other resources that will be used to move an economy from inefficient means of production to the use of more sophisticated system.<sup>21</sup>

**iii. Accountability and Transparency:** The qualities of accountability and transparency are necessary ingredients for industrial development in Nigeria. An accountable and transparent Nigerian society would shy away from the mismanagement of the financial resources of the nation meant to boost the industrial sector. For a long time now, large sums of money claimed to have been invested in the industrial sector have not always been accounted for. Most often than not, these large sums are embezzled and nothing is seen on the ground let alone to see ongoing production. For instance in Nasarawa State, fertilizer blending company along Makurdi road Lafia with branch in Keffi. Sacks Production Company at Akwanga. In Benue State the much celebrated fruits Processing Company at Wanune near Gboko, apart from the fat budgets made for renovation of industries like; Refineries, Arewa Textile, Peugeot Car Assembly in Kaduna, ANAMCO, Jos Steel Rolling Company, Ajaokuta Steel Complex in Kogi State etc. Every *kobo* invested in the sector should be accounted for by those entrusted with it. Such an accountable and transparent system makes it possible for the country to weigh its strengths and weaknesses in its industrial investment. Until the Nigerian system assumes an accountable and transparent status, industrial development will remain frustrated.

- iv. Respect for Human Life and Dignity:** Respect for human life and dignity entails that the employees who are human beings are appropriately treated and not used as tools in the industrial system. Workers are to be adequately remunerated so that they are able to effectively meet their daily needs. Occasions of low pay and sometimes belated payment for work done must be avoided. Here, the dictates of the principle of motivation should be adequately employed.
- v. Fairness and Justice:** The need for fairness and justice to boost the Nigerian industrial sector is imperative. This entails showing of concern needs to be shown as to how people are employed into the industrial sector and the necessary compensation for regions where industries are located. There have been complaints of nepotism and favouritism in the appointment and selection of personnel for the industrial sector. In most of these cases, incompetent hands are picked that run the system down rather than strengthen it. There is also need to ensure fairness and justice in the distribution of the gains of the industrial sector. Nigeria has suffered instability as a result of agitations arising from injustice. This must be checked to make industrial development possible in Nigeria.
- vi. Patriotism:** A patriotic spirit is most needed in Nigeria for its industrial development. Patriotism involves pledging loyalty and love for one's country over and above every other thing. This love also extends to everything that is of one's country. The most prominent area patriotism is needed is in the patronage of Nigerian-produced goods. Citizens must give preference for Nigerian-made goods and services over and above those that come from foreign countries. When patriotism permeates every dimension of Nigeria's industrial efforts, the industry will bloom beyond measures.

- vii. Security of Life and Property:** For Nigeria to enjoy a fertile industrial atmosphere, there must be security of life and property. Nnamdi et al (2015), underline the significance of this factor this fact when they point out: “Security of lives and property plays a major role in the development of any economy or region as investors want to be assured of the safety of their investments”.<sup>22</sup> The precarious nature of the Nigerian environment constitutes a big challenge to industrial development. Insecurity arising from the activities of militant groups must be addressed to ensure that the environment is peaceful. The advantage of a peaceful and secured environment lies in the fact that it would attract investors and ensure the safety of structures laid down for industries. Many industrial plants were abandoned as a result of war and tribal clashes while others were destroyed. It is worse now that militancy in the Niger-Delta region and insurgency in North-Eastern Nigeria are troubling the Nigerian environment. The industrial workforce and machinery cannot function effectively without security. Nigeria must address security issues to ensure industrial development.<sup>23</sup>
- viii. High Standard Taste:** The xenocentric mentality (preference for anything foreign) characteristic of Nigerians flows from the substandard goods and services provided locally. Mba (2017), is right to have observed that “most of the products made in Nigeria are usually substandard. This has decreased the reliance of the masses on locally made goods; hence, dependence on foreign goods for their satisfaction”.<sup>24</sup> It is a fact that people prefer to go quality goods and at a cheaper rate. There is need for a revolution as to the quality of goods and services made available for consumers. Effective measures should be taken to frustrate industries that specialize in producing substandard goods.

**ix. High Moral Decay/Poor Work Ethics:** Morality is a *condition* for the success of every worthwhile venture in life. A morally sound mind that does things within ethical lines is a blessing to the project of industrial development. When human endeavour drifts away from moral boundaries, no meaningful success is attainable. The typical Nigerian mind is corrupt and lacks the moral will power to pursue good. The lack of responsibility, transparency, accountability, sincerity, hard work, patriotism and the like has led to serious harm to industrial development. When it is impossible to show those moral traits in developing and managing industries, no headway is possible. There is ample evidence of *laissez faire* attitude towards work and inability of workers to keep to the regulations of the industrial sector as well as failure of the employers too to pay workers is also another side of the story. This clash of inadequacies tempers with the fortunes of the industrial sector crippling it to its knees.

## **Conclusion**

The potentials of industries have for economic development of nations cannot be overemphasized. Great nations in the world today have attained their present status as a result of the keen attention paid to industrial ethics. In an age characterized by a supersonic growth in science and technology, any nation concerned about development cannot, but explore the opportunities at its disposal for its own good. It implies that improved science and technology can engineer industrial proliferation. This is the contemporary magic that developing nations like Nigeria, need to patronize. As true as the magic may be, its potentials can be truncated when the ethical power does not accompany those potentialities. It is not enough to have a high population capable of providing robust labour force and abundant natural resources. So much work needs to be done to ensure that these special resources are well put to use and managed judiciously.

In the Nigerian context, the need, to consider the moral factor is undeniable. Thus, a morally reliable Nigeria has the capacity to pursue industrial ethics that will fine-tune its economic fortunes for good. Indeed if the ethical consideration as it relates to industrial issues in Nigeria is taken seriously, the fortune of Nigeria as a nation would be favourable. The potentials inherent in the industrial sector would be fully enjoyed, namely, robust economic growth, enlarged employment opportunities, appreciable standard of living, reduced poverty level, among others. In so doing, Nigeria would develop rapidly and rank as one of the developed nations in the world as every realistic analysis would acknowledge.

## **Recommendations**

Based on the finding of this research, the following recommendations are made:

- i.** The government should make frantic efforts to put the industrial sector and all its riches in the hands of morally upright and competent personnel. This should be done without the spirit of favouritism and nepotism that has degenerated the system.
- ii.** The government should establish an uncompromising legal framework to adequately punish, without fear or favour, all those found morally wanting at any point in time in the industrial sector. This is necessary because human behaviour changes.
- iii.** Every segment of the Nigerian system should acknowledge the moral gap that impedes industrialization. Acknowledging, first of all, that this problem exists in both private and public lives is a bold step to solving it.
- iv.** The government should employ the services of only competent personnel in drafting good industrial policies that would benefit Nigeria. Special people could be strictly trained on this.

- v. In addition to number three above, the government should establish an institution or structure that would monitor the proper implementation of industrial policies without unnecessary interference that is sometimes politically motivated.
- vi. The government should improve science and technology education to drive our economy from a consumer-based one to a productive one. With this, Nigeria will not only be known for the importation of goods, but also for the exportation of manufactured goods.
- vii. Nigerians should embrace moral struggle for effective industrialization and distance themselves from sentiments of any kind (religious, ethnic, cultural etc.) that have often provided explanations for most of the crisis that have rocked the smooth running of the industrial sector. Morality should be based on universal principles that are not discriminatory or sectional.
- viii. The government should encourage further research on the negative consequences of industrialization so that these are adequately checked to avoid any possibility of counter-productivity within the sector.

## End Notes

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