SUSTAINABLE IRON AND STEEL PRODUCTION IN NIGERIA: THE TECHNO-ECONOMIC BACKBONE OF THE NATIONAL DEVELOPMENT

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ABSTRACT
A sustainable iron and steel production is the techno-economic backbone of the national development of any nation including in Nigeria. The iron and steel industry produces a spectrum of products and consumes a myriad of input elements. The steel sector in the developed economies is the highest employer of labour of the entire economic sector mainly due to their work multiplier effect. The vision 20:2020 of the transformation agenda of the Federal Government cannot be realized unless there is timely and sustainable iron and steel production in Nigeria. This is the thrust for this paper which encompasses the global scenario of the developed economies and Nigeria's anomalous iron and steel industry vis a vis the national transformation agenda. The paper concludes that there is no doubt that the steel industry in Nigeria could still be reactivated to provide the necessary vehicle for industrial transformation and growth, provided there is the will, commitment and genuine patriotism, though it has been stagnant for so long.

1.0 INTRODUCTION
The iron and steel industry of any nation is the core industry, generally complex, that produces a spectrum of products and consumes a myriad of input elements. The steel sector in the developed economies is the highest employer of labour of the entire economic sector mainly due to their work multiplier effect. Iron and steel are so important that a steel company in the Republic of South Korea has this inscription on its entrance: ***"A nation that controls Iron controls the world"*** – Pohang Steel Company Ltd. The Vision 20:2020 of the Transformation Agenda of the Federal Government cannot be realized unless there is timely and sustainable iron and steel production in Nigeria.

With continued mass importation of iron and steel products into Nigeria instead of producing our own on sustainable basis and in good time, the following are bound to happen: more buildings will collapse, more graduates especially engineering graduates will be unemployed, more brain drain will take place, the value of the national currency will diminish the more, vision 20:2020 and MDG's will forever be a mirage, the Transformation Agenda will be "Alice in the Wonder Land" and the endurance limit of the restless unemployed youths will be exceeded sooner than later. All these have serious consequences on the development and security of Nigeria as the two are umbilically connected. The Iron and Steel Industry is the backbone of the National Transformation Agenda. The question is, how do we revamp the comatose status of the iron and steel projects in Nigeria particularly Ajaokuta Steel Complex, Delta Steel Company and the three inland rolling mills located in Jos, Katsina and Osogbo?

2.0 THE G-8 COUNTRIES' IRON AND STEEL INDUSTRY

Global steel production grew enormously in the 20th century from a mere 28 million tonnes at the beginning of the 20th century to 781 million tonnes at the end. Over the course of the 20th century, production of crude steel has risen at an astounding rate, now fast approaching a production level of 1.6 billion tonnes per year. Today, it is difficult to imagine a world without steel. During the 20th century, the consumption of steel increased at an average annual rate of 3.3%. In 1900, the USA was producing 37% of the world's steel. With post war industrial development in Asia, that region now (at the turn of the 21th century) accounts for almost 40%, with Europe (including the former Soviet Union) producing 36% and North America 14.5%.

Steel consumption increases when economies are growing, as governments invest in infrastructure, transport, and build new factories and houses. Economic recession meets with a dip in steel production as such investments falter. In the developed countries, the trend is on consolidation of industry. Cross-border mergers have been taking place for several years. The focus is on technological improvements and new products. Globally, the steel industry became a billion tonne industry in 2004. How much more it will grow will depend primarily on how much more steel is consumed in the developing countries. In the G-8 countries, growth and development indices seem to be tied to the *per capital consumption of iron and steel products*, hence their continued dominance of the production of machinery and equipment to run the major industries of the world. Table 1 shows the top fifteen producers of steel in which we have the G8 and seven top developing nations.

2.1 The Developing Nations' Iron and Steel Industry

After being in the focus in the developed world for more than a century, attention has now shifted to the developing regions. Towards the end of the last century, growth of steel production was in the developing countries such as China, Brazil and India, as well as newly developed South Korea. Steel production and consumption grew steadily in China in the initial years but later it picked up momentum, and the closing years of the century saw it racing ahead of the rest of the world. China produced 220.1 million tonnes in 2003, 272.2 million tonnes in 2004 and 349.36 million tonnes in 2005. That is much above the production in 2005 of Japan at 112.47 million tonnes, the USA at 93.90 million tonnes and Russia at 66.15 million tonnes.

Table 1: Top 15 Crude Steel Producers in the world.

Years / Countries	2011 (million metric tonnes)	2012 (million metric tonnes)	%change	% Share 2012
China	702.0	715.5	-5	10.9
EU27	177.7	169.0	0	6.9
Japan	107.8	107.2	3	5.7
USA	86.4	88.7	6	5.0
India	73.5	77.6	2	4.6
Russia	68.9	70.4	1	4.5
S.Korea	68.5	69.1	5	2.3
Turkey	34.1	35.9	-2	2.2
Brazil	35.2	34.7	-7	2.1
Ukraine	35.3	33.0	2	1.3
Taiwan	20.2	20.7	0	1.2
Mexico	18.1	18.1	10	0.9
Iran	13.2	14.5	5	0.9
Canada	13.0	13.5	-6	0.5
S. Africa	7.5	7.1	-4	4.6
Others	75.2	71.8	**1**	**100**
Total	**1536.2**	**1547.7**		

(Source: www.issb.co.uk)

Among the other newly steel-producing countries, South Korea has stabilized at around 46-48 million tonnes, and Brazil at around 30 plus million tonnes. This brings the focus of the industry to India. Considering a steel consumption of 300 kg per man per year to be a fair level of economic development, India will have to come up to somewhere around 300 million tonnes, if it is to fulfill its ambitions of being a developed country. That, of course, is a long journey from the present production level of around 88.7 million tonnes but one must consider its past before coming to a conclusion about its potential. India was producing only around a million tonnes of steel at the time of its independence in 1947. By 1991, when the economy was opened up steel production grew to around 14 million tonnes. Thereafter, it doubled in the next 10 years, and then it is doubling again, maybe over a slightly longer span. Steel Production in India is expected to reach 275 million tons by 2020 which could make it the second largest steel maker.

Nigeria, the most populous black nation on the face of the earth, deserves to be transformed from its present controversial status of underdeveloped/developing to a developed nation. This is where the transformation agenda of the Federal government is a welcome development. It takes from four to six years for a new steel plant in the G-8 countries to go from start up to full capacity (100%) utilization whereas no eyebrows are raised in Nigeria when similar installations keep stumbling and falling for more than 29 years only to record a mere 24.3% capacity utilization in only one out of the 29 years.

3.0 THE NIGERIAN IRON AND STEEL SUBSECTOR OF THE ECONOMY

3.1 Historical Background

The mission of the Steel plants in Nigeria was a consequence of a well mapped-out strategy to achieve clearly stated objectives which include the provision of a solid industrial base for technological development, the promotion of modern technological transfer and the acquisition, conservation of foreign exchange, export promotion and employment creation. It was rightly envisaged that both the

Automobile Assembly plants and Agro-equipment development would benefit immensely from the Steel plants.

Planning for the Nigerian Steel Industry started around 1958. Many international organizations and consulting firms had been commissioned at various times to study the feasibility of steel plants under the aegis of the Federal Ministry of Industries. Parallel efforts were also made to identify and analyse the principal raw materials needed for the steel industry. In 1971 an extra-ministerial agency was established by Decree to focalize efforts required to actualize a steel plant. That Agency was called "Nigerian Steel Development Authority" (NSDA).

Under the NSDA, organized efforts were intensified in market survey of the steel market in Nigeria; on in-depth geological investigation of local raw materials, on aeromagnetic survey for alternative sources of iron-ore etc. The discovery of the Itakpe iron ore deposit in 1972 by the Soviet aero-magnetic survey team catalyzed the formal signing of a Global contract in 1975 with the Soviet state-owned firm of Tiajpromexport for an integrated steel plant of 1.3 million tonnes of long products to be immediately expanded to 2.6 million tonnes in flat products while the third phase will raise the annual production to 5.2 million tonnes. The first phase was to be completed in 1981. The plant was to be based on the traditional Blast Furnace/Basic Oxygen Furnace Technology of steel production.

After the Soviet's finding on the viability of a steel industry in Nigeria in the seventies, (in the height of Nigeria's new found economic wealth - oil), European countries which hitherto had advised Nigeria to concentrate on Agriculture rather than venture into the high-tech steel business, began to flood the Federal government with proposals on alternative technologies for new-breed steel plants based on the "Direct Reduction (DR) Process". In 1975 the Federal Government signed a "Turn-Key" contract with a German-Austrian Consortium for a DR plant to be located in Aladja, Warri (DELTA STEEL COMPANY). It was financed from a guaranteed loan from Deutche Bank. The DSC plant was completed and commissioned in 1982, while Ajaokuta plant still remains a 'project'.

3.2 The Missing Link

"*We have raised the dust and then we complain we cannot see"* – George Beckley

The problems militating against sustainable iron and steel production in Nigeria are legion but they are not unsolvable. They range from international conspiracy, lack of political will, weak technological base, lack of in depth analysis of what it takes, poor reward system, corrupt transactional leadership rather than transformational leadership, lack of systematic manpower development, lack of synergy among government, academia and professional bodies, organized private sector and industry. These factors among others have cumulated into the comatose status of the iron and steel industry in Nigeria.

4.0 STATUS OF THE VARIOUS IRON AND STEEL PROJECTS

4.1 The Ajaokuta Steel Company

A cursory look at Ajaokuta Steel Company referred to as the bedrock of Nigeria's industrialization shows that this company has a multiplier linkage effect on the national economy. If Phase 1, that is, production of 1.3 million tonnes of liquid steel, is completed and put to commercial use, the nation has the following direct benefits to derive:

i. Employment of 10,000 workers in the Plant

ii. Employment of not less than 20,000 Nigerians in the raw materials industries providing feed-stock to the plant
iii. Employment of not less than another 30,000 Nigerians in the industries that use the products of the plant
iv. Conservation of foreign exchange used for importation of steel products annually
v. Contribution of not less than 30% of the inputs to the automotive industry in Nigeria, in the first instance
vi. Ajaokuta Steel Plant has the capacity to meet most of the national requirements of Chemicals and tar (as by-products of the steel production process) and Refractory bricks, using locally available raw materials and the Alumino-Silicate Refractory Plant
vii. Export potential to ECOWAS sub-region
viii. Most industries in Nigeria have problem sourcing for their machinery and spare parts. The Ajaokuta Steel Company's well-equipped Engineering Works Complex can assist to a large extent.

4.2 The Delta Steel Company

The steel plant at Ovwian/Aladja, Delta Steel Company, DSC, a Midrex Direct Reduction (DR) technology, was commissioned in 1982 and produced steel from imported iron ore and local steel scrap. At one time DSC had taken super-concentrate from Itakpe (in Nigeria) to do away with importation. DSC supplied steel billets to the Inland Rolling Mills at Jos, Oshogbo, and Katsina. DSC has been on the verge of collapse for the past few years (since 1994), due to a multiplicity and inter-play of factors:- ministerial strangle-hold and insincere directives; under funding; misuse of scarce fund; over-costing of inputs; under-costing of products; and the general attitude (or lack of it) towards government-owned enterprises. With the near-collapse of DSC came the paralyses of the Inland Rolling Mills.

It can be recalled that the steel produced in Aladja met international standard, the list of available standards of steel produced by the company include the following:

i. NST 34LC (Used for nails, wood screws, door hinges and barb wires)
ii. NST 37-2 (Used for angles, channels, bolts, nuts, screws and plain bars)
iii. NST 44-2 (Used for plain round bars for reinforcing concrete, medium strength bolts and nuts)
iv. NST 50-2 (Used for bolts and nuts)
v. NST 60-2 (Used for large bolts and nuts)
vi. NST 60Mn (Used for high strength rib bars)
vii. NST 55Mn (Used for high strength reinforcing bars and wire)
viii. NST 67-2 (Used for machine tools, bolts and nuts)

One notable achievement worthy of mention is that in 1994/95 Nigerian Scientists, Engineers and Technologists teamed up to develop a process of upgrading the Itakpe Iron Ore to the super concentrate (65/67%) grade without addition of any beneficiating plant, contrary to the original technology designer's provision. This development lead to the production of the first all Nigeria Steel, the iron ore of which hitherto had to be imported at colossal foreign exchange volume from Brazil or elsewhere. The unfortunate thing is that immediately this achievement was made known to the Government, then the Government of the day starved the entire Nigerian Steel sector and did not allocate a kobo in its 1996 budgetary allocations. Following this, most of the members of the team that developed the Itakpe iron ore to the super concentrate grade were rewarded with mass retrenchment by the authorities. This action grounded all efforts and virtually killed off the Nigerian Steel Sector with resounding implication on not only the public steel sector, but also to the private sector, till this day. This encouraged the massive importation of long products, which in most cases are poor quality products. The

history of many collapsed buildings in the country that led to the loss of several lives is a testimony to the poor quality of most of the imported products.

4.3 The Private Steel Companies

The Private Steel Mini and Rolling mill operates a little more efficiently than the public ones but are far from meeting the installed capacities of the mills. Unfortunately, there is no serious inspection, monitoring and control of their personnel, process and products. This is where all hands must be on deck to ensure early passage of robust national Metallurgical Bill.

5.0 THE WAY FORWARD

Lord Luggard, one time Governor-General of Nigeria in his mandate to Africa, frankly said:

Let it be admitted from the onset that European brains, capital and energy have not been, and never will be, expanded in developing the resources of Africa from motives of pure philantropism"

Thus, the Government in line with its Transformation Agenda and Local Content Development Policy should adequately motivate and challenge technically competent nationals and Nigerians in Diaspora to be in the fore front of timely and sustainable iron and steel production in Nigeria.

I. We Should Adopt the Right Attitude – Political Will
   Let's be honest with ourselves, the first requirement is honesty of purpose:

   "*Honesty is the first chapter in the book of wisdom"* -Thomas Jefferson

II. Set Up a National Regulatory Body on Steel Development
III. It has been regrettably observed that research carried out in our ill equipped tertiary institutions and research institutes are not generally need-driven and industry based. Therefore, there is need for synergy among the government, industry, academia and the private sector. Along this line, human capacity building, research and development in the metallurgical industry particularly iron and steel sub sector should be given serious attention it deserves.
IV. In order to ensure consistent funding of the iron and steel industry in Nigeria, Steel Development Fund should be set up and should be transparently operated.

6.0 CONCLUSION

The above suggests that in terms of revenue Nigeria is yet to start exploiting the steel sector. There is therefore no doubt that the steel industry in Nigeria can survive provided there is the will, commitment and genuine patriotism, though it has been stagnant for so long. It could still be reactivated to provide the necessary vehicle for industrial transformation and growth.

Having presented the prevalent perspective in our march for steel development, we are now in a most critical period. We need to immediately desist from the erstwhile unproductive practice of being very long on words and rather short in action.

Finally, all the structures and the platform, on which the steel industry rests, are in state of collapse and if remedial provisions are not made at the right time, the consequences on the Federal Government Transformation Agenda will be grossly adverse. The right time to complete the iron and steel projects in Nigeria is now.

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