

**A CRITICAL LOOK AT THE NIGERIAN STEEL INDUSTRY ----A DARK
PAGE ON THE HISTORY OF NIGERIA AND THE METALLURGICAL
PROFESSION.**

By

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Abstract:

This paper critically analyzed the Nigerian Steel Industry and Ventures from inception to the present state. A comparative analysis of the Nigeria's Direct Reduction –Base Iron producing Plant installed more than three decades ago at Ovwia- Aladja near Warri, Delta State of Nigeria with similar modules elsewhere showed that while similar modules installed elsewhere attained more than 50% of its installed capacity in two to four years, Nigerian module could not be adequately run to recordable installed capacity utilization after more than two decades of installation. Ajaokuta Steel Plant and other Steel Ventures were also analyzed with dismally appalling findings. The role played by the Metallurgical & Materials Profession in the trying years of the Metallurgical & Materials Industry is to say the least disappointing. The bright light at the end of the tunnel comes from professional rethinking and armament , serious implementable policies on the power sector. Solutions to all these problems were proffered in order to challenge the government of Nigeria and the profession to be more serious on the known life wire of industrial and technological existence of Nigeria.

1.0 INTRODUCTION:

CHRONOLOGY OF EVENTS IN THE HISTORY OF THE NIGERIAN STEEL INDUSTRY

A brief chronological recapitulation of the key events in the history of the Nigerian Steel Industry is given below for an overall view of the Steel Development in Nigeria.

In 1958, the idea to establish a government-owned Steel Company was conceived but the politics of location killed the idea. The idea re-emerged in the mid-sixties at the threshold of the Nigerian crisis.

In 1967, during the Nigerian civil war, the idea matured into a bilateral relationship between Nigeria and the former Union of Soviet Socialist Republics (USSR) and a team of Soviet experts was commissioned to conduct the feasibility study on setting up an integrated steel plant in Nigeria.

In 1971 the Nigerian government signed a contract with the Techno-export Company of USSR for a detailed geological and geophysical exploration of Nigeria for the raw materials requirement of the Steel Industry. This contract was executed with the then Federal Ministry of Mines, Power and Steel. Abundance of raw materials especially iron ore, limestone and dolomite was confirmed.

On 14th April 1971, the Nigerian Government in a Decree No.19 established the Nigerian Steel Development Authority (NSDA) to identify, locate and procure locally available raw materials for the steel industry.

By the middle seventies, NSDA re-established the availability of Iron ore and coal in Nigeria.

In 1974 Tiajpromexport (TPE) of USSR submitted a preliminary project report (PPR), rationalized in 1975 when the siting of the Company at Ajaokuta to utilize the Itakpe iron ore was agreed upon.

In 1979 NSDA was replaced with the National Steel Council made up of the Mining and Exploration Division based in Kaduna and the Metallurgical Development Centre based in Jos.

On 18th September, 1979, the Associated Ores Mining Company (AOMC) now the Nigerian Iron Ores Mining Company (NIOMC) was established by Decree No.60

In the same 1975 TPE was commissioned to prepare a detailed project report (DPR) which was submitted to the Nigerian Government in 1977.

In 1978 DPR was examined, modified and finally accepted.

The DPR specified in broad terms the general layout, the raw materials requirements and the tentative master schedule.

The above account shows that DPR for the Ajaokuta Steel Company became a working document since 1978, a period of almost thirty-one (31) years now. At this stage the then Federal Ministry of Mines, Power and Steel and the Steel Companies negotiated to establish the Beneficiating plant at Itakpe near Okene, the site of iron ore deposit, to supply iron concentrates to the Steel Plants.

In 1975/80 Development Plan, the Nigerian Government disclosed its intention to set up additional steel plants based on the Direct Reduction Route of producing iron to be sited in Ovwian –Aladja in order to utilize copious natural gas being flared in the various oil fields.

The Nigerian Government also decided to establish three (3) Rolling Mills, each of 210,000 tons annual capacity to be sited in Katsina, Oshogbo and Jos.

In October, 1977, the contract for the construction of Delta Steel Company at Ovwian – Aladja , Warri was awarded to the German Consortium headed by Messrs GMBH. Delta Steel Company would consist of seven units integrated process-wise to produce 1 million tons of liquid steel per annum and a captive rolling mill with 320,000 tons rolling capacity .

In 1982 precisely on 29th July, the fully completed Delta Steel Plant was commissioned and production started in the same year.

In 1982 and 1983 the Rolling Mills at Jos, Katsina and oshogbo were all commissioned and were expected to obtain their billets from Delta steel company Ovwian-Aladja in Warri .

In 1987, in order to ensure that steel plants were not starved of raw materials Government established the Raw Materials Research and Development Council (RMRDC) by decree No.39 under the Federal Ministry of Science and Technology. RMRDC should amongst other things establish self- supporting small scale projects on raw materials exploitation

to expedite industrial development for maximum utilization of local raw materials deposits as inputs to the steel industries.

The National Metallurgical Development Centre (NMDC) should undertake studies and projects on beneficiation of locally available raw materials, development of processes and products for the exploitation of these raw materials into pilot scale for commercialization .

On the other hand, to ensure availability of junior and middle level personnel support for the Steel Industry, the Nigerian Government established the Metallurgical Training Institute (MTI) to be located at Onitsha to train this cadre of staff for the Steel Industry.

2.0 SOME PECULIARITIES OF THE GOVERNMENT-OWNED STEEL COMPANIES

Ajaokuta Steel Company:

The Ajaokuta Steel Plant design was based on the blast furnace route to iron production with initial capacity of 1.3 million tons of liquid steel per annum with built – in capacity for possible future expansion to 2.5 million tons per annum in the first phase and up to 5.2 million tons per annum in the second phase. By the initial costing, the first phase was estimated to cost 2.5 billion naira. The present phase of the company and the amount already sunk into the Ajaokuta Steel Project or Company are any body’s guess.

The Ajaokuta Steel Company, the engine of industrial emancipation of Nigeria consists of the following process units:

- Raw materials preparation unit (including the sintering plant)
- Coke-oven and by product plant
- Iron making unit
- Steel making unit
- Rolling mill
- General Auxiliary unit

Ajaokuta Steel Company was designed and specified in Russian System (GOSH) yet in 2003 an American based Company found its way in Ajaokuta to run the company with disastrous consequences.

Blast furnace operational route requires continuous operation for at least 5 years and this presupposes stock piles of raw materials to support this period of production.

The basic raw materials in tonnes required for the blast furnace at Ajaokuta for a year were as follows:

Iron ore (52 per iron content): 2.2×10^6

Coking coal: 1.2×10^6

Limestone and dolomite: 660,000

Refractory clay: 63,000

Ajaokuta projected product mix:

This consisted of Rounds, ribbed bars, Angles, plates, strips, channels, Beams and Tees, Billets (1000x100) mm²

Projected Ajaokuta blast furnace slag Applications:

Slag from the Blast Furnace was to be used in road surfacing, aggregate for concrete, fertilizer for farmers, rock wool raw materials, cement and others.

All these benefits from the Ajaokuta Steel Company are all fairy tales now!!!

Delta Steel Company , Ovwian-Aladja, Warri:

This company was based on the German DIN standard and consists of the following units operationally integrated: Beneficiating and pelletizing plant, Direct Reduction (DR) plant, made up of two modules, the Steel Melt shop, the continuous casting shop, the air separation plant, the foundry, the General Maintenance Shop with feeder units in various process departments. Light and heavy vehicle maintenance units were in this Maintenance Shop.

The basic raw materials in tons required for the Delta Steel Company Operations were as follows in tones per annum:

Iron Ore: 1.5×10^6

Limestone: 130,000

Coke: 5000

Scrap: up to 160,000

Refractories: 16, 000

Projected product mix:

This was made up of direct Reduced Iron (DRI), Billets (120x120) mm², rounds, ribbed bars, angles, strips and channels.

Liquid Steel Capacity (tons): 1,000,000

It was desired by ambitious and patriotic Engineers in the middle eighties to modify the Continuous Casting Station to blooms production for the final production of plates but enemies of progress frustrated their efforts. Plate production in the Delta Steel Company would have enriched the product mix for other industrial applications.

STRANGE FOR DELTA STEEL COMPANY LTD: It is not clear whether DSC as it is popularly known is alive or dead or dying in a country at the peak of her technological growth. These are the happenings in the Metallurgical industries especially the Steel Industry in Nigeria that shock both the angels and even the devils.

Government Inland Rolling Mills:

They were designed to produce 210,000 tones of rolled products based on (120x120) mm² billets from Delta Steel Company Ovwian-Aladja. These are stories or fairy tales for our children and children'children.

3.0 : THE PRIVATE STEEL COMPANIES

For Private Steel Companies, apart from Universal Steel, Ikeja, and Continental Iron and Steel, Ikeja that produced liquid steel and billets, others (Mayor Engineering, Ikorodu; Mandarin Steel Company, Ilupeju; Sell Metal, Ikeja) produced billets (100x100)mm², (120x120)mm², (60x60)mm², pipes (only Mandarin Steel Company produced pipes), and rods of dimensions (12 mm, 16 mm, 40 mm) using billets, crop ends and scraps.

Quantity of steel products from private steel companies is a minuscule compared to the Steel products from operating Government Steel Companies.

4.0: ANALYSIS AND COMMENTS FOR A WAY FORWARD**A Pass for the Nigerian Government on the Steel Industry Venture:**

The chronological review of the key events in the history of the Nigerian Steel Industry is informative. In the first place the Government of Nigeria scored a passing grade for its efforts to place Nigeria in the world steel map.

The edits and establishments and their sequencing to found the Nigerian Steel Industry on a strong footing are commendable.

Some special species of Nigerians found their way to the pinnacle of leadership to ensure that all monies earmarked for remarkable development of the Steel Industry ended up in the evil pot of corruption for purposes other than developing the Steel Industry and Nigeria.

The question is," all the billions of naira or dollars embezzled, where are they now?".....garbage and Nigerians especially the youths are seriously suffering and all of us are no longer at ease including those that stole the billions of naira or dollar.

As a result of all these corrupt unpatriotic practices, **all the efforts** made by patriotic Nigerians in Government for putting Nigeria in the Steel Map of the world failed woefully. Unfortunately it is still failing today leaving most Nigerians with the Will to develop the Nigerian Steel Industry and Nigeria confused and disorganized.

Where did we go wrong?

The question is what went wrong? Where did we go wrong? Were the policies wrongly structured? Were the sequencing of edits and establishments wrong? Do we lay blame on the operators of the edits and policies? Was there any unforeseen design error? Is it the fault of our physical or social environment? Are the gods to be blamed? Did we politicize the Steel Industry, bringing those obnoxious so-called Nigerian factors..... quota concept, ethnic balancing, putting round pegs in square holes to balance an imaginary equation, 10% commission, evil and mean concept, political party factor, magical but well-designed mechanism of reflecting budgets back to those who waste it for their private use instead of for the good of the Steel Industry and Nigeria. What went wrong is anybody's guess and we shall all brainstorm and guess it right today!!!

The Sleepy Ajaokuta Steel Company should wake up!!

The Ajaokuta Steel Company took off in principle in 1978 when the DPR was finally accepted. For almost 30 years plus, the company has been in a deep slumber yet many Chief Executives had come and gone, billions of naira had been spent. The questions are, Do we have a definite Steel Policy for the Nigerian Steel Industry? Are we changing the Chief Executives so fast?" Do we have credible criteria for choosing and selecting our Chief Executives? What were the qualities of the Chief Executive that have piloted the ship of the Ajaokuta Steel Company? How were they selected for the onerous task?

Is the adopted technology for producing iron and steel appropriate for our technological culture?

Is Ajaokuta Steel Company oversized for Nigerians to manage as a single entity? Are we putting square pegs into round holes?

Do we have the **WILL** to operate the steel plant to develop our country, Nigeria? Are professional Engineers/Metallurgists in charge of the Nigerian Steel Industry? Do we depend on lobbying to appoint people that will operate our industries or parastatals?

Most of the questions posed above are rhetoric.

We need to lay down clear criteria devoid of political chauvinism for selecting Chief Executives for the Steel Industry and a minimum period of 5 years of stewardship for the Chief Executive to prove his mettle.

It is worthy to note that the Steel Industry is different from other industries..... a lot of thinking and planning, clear Government Steel Policy and strong **WILL** to weather through formidable challenges that are inevitable in steel making, should be in place.

Records on the Steel Industry in other countries including the advanced countries show that running a Steel Industry is not a bed of roses, it is not a place where one can reap without sowing.

Steel is strategic in a developing country like Nigeria so “classing the steel industry as a money-making venture or a national cake industry will permanently destroy the Steel Industry”.

Steel Industries are one of the few Industries that need high - caliber technical management with unshakable **WILL** to succeed.

Blast Furnace Technology-An appropriate technology?:

The Blast Furnace Route Technology for producing iron is appropriate for our unwritten technological culture which had thrived in many parts of Nigeria namely Igbo Ukwu, Ife, Benin, Nok and Nupe cultures. Iron ore, limestone, dolomite and coal that are the required feeds for the blast furnace are amply available in Nigeria.

Decentralization of Ajaokuta Steel Company:

Ajaokuta Steel Company should be decentralized into Blast Furnace Operations, Metallurgical & Steel Management Training, Rolling Mills, Administration (planning and logistics), Marketing and Sales and each should have a Technical General Manager.

These Technical General Managers will be headed by a Technical Managing Director for coordination of operations and ensuring that the product- mix as prescribed by the Nigerian Government is preserved. The position of the Technical General Manager should be open to both capable and well-qualified Nigerians and Expatriates.

It is recommended that these positions are advertised globally so that best candidates apply for the selection interview.

Foreign Technical Assistance should be scrapped:

Foreign technical assistance programs should be scrapped, permanent employment for specific periods (5 years or more) will be preferred to technical assistance so that the expatriate staff belong and participate fully in the affairs of the company. The Nigerian Steel Industry had not benefited from the Technical Assistance program.

Backward Integration-----Counter Productive?

Backward integration adopted sometime at the Ajaokuta Steel Company was an unnecessary short-cut.

It was illusory and defeatist to hide poor planning and execution of a complete project. It created a wrong impression that Ajaokuta Steel Company has been commissioned.

Government's genuine initial agenda for the Nigerian Steel Industry would have been followed to the letter.

Government raw materials policy should be revisited:

The sequencing of various establishments for raw materials acquisition by government should be revisited and followed to the letter. By the Government's initial prescriptions on raw materials for the Steel Industry, raw materials deposits were to be sourced, located accessed, mined, beneficiated, refined and stockpiled before setting up the steel plants. This was applicable to the Ajaokuta Steel Company, but along the line operators fouled the edit. The operators so to say jumped the gun and lost the race.

Government Raw Material Establishments should operate along Government guidelines:

The National Metallurgical Development Centre, Jos established in 1971 before the final acceptance of the DPR for Ajaokuta Projects in 1978 was expected to have performed laboratory scale beneficiation and analysis of raw materials for the steel

industry and set up pilot plants for the above processes for commercialization far ahead of the commissioning of the steel plants. Although the Centre acquired many useful equipment for metallurgical research, its operations failed to have relevance to the nagging problems of the Steel Industry.

Many problems plaguing the Steel Industry like refractories , product and process development of the grindability and reducibility of Itakpe iron ore concentrates were not adequately studied by the Centre.

The Centre was too far in their operations from the Steel Industries it was supposed to serve.

The Raw Materials Research and Development Council which was a success story derailed in its major assignment of developing raw materials for the Steel Industry.

Its preoccupation was on agriculture and gemstones.

For some reason these Government Establishments had minds of their own. Problem was possibly lack of monitoring and control by Government.

Metallurgical & Materials Engineering programs in Universities and polytechnics should be challenged with these raw materials problems.

- **Lack of WILL:**

From an extract in the report of the Midrex Corporation that constructed the DR Module for producing Direct Reduced Iron installed at the Delta Steel Company Ovwian-Aladja, it was shown that Brazil which operated the same type of plant as Delta Steel Company hit the installed capacity after almost 10 years of operation, Argentina hit and surpassed their installed capacity after 7 years, Venezuela after 11 years, Egypt after 6 years,

Iran after 10 years, Saudi Arabia after 3 years, India after 7 years , South Africa hit above 50% after 4 years while Delta Steel Company with the same plant configuration operated for more than 25 years without attaining above 25% of its installed capacity.

Infrastructural problems, personnel problems, political problems, bribery and corruption are suspect contributing factors to this lack of will on the part of Nigerians.

The Steel Industry should be insulated from all these.

- **Unnecessary linkages:**

Linkages of steel plants for non-technical reasons were injurious for the operation of the Steel Industry. For example, the three inland rolling mills were linked to Delta Steel Company for their supply of billets instead of allowing the rolling mills to source for their own billets or buy from Delta Steel Company on competitive basis instead of pegging the Delta Steel Company billet prize for the benefit of the rolling mills. These linkages contributed to the death of the Nigerian Steel Industry.

- **Improper feasibility work:**

A feasibility work that was premised on the importation of more than seventy percent of raw materials for an industrial venture and still recommended the venture feasible is faulty. This was the case with Delta Steel Company. The feasibility work might have been improperly done or necessary factors were not taken into consideration.

5.0: Conclusion:

Quoting from President Obama's Inaugural Address, "Starting today, we (Engineers/Metallurgists) must pick ourselves up, dust ourselves off and begin again the work of remaking America (the Nigerian Steel Industry).

For every where we (Engineers/Metallurgists) look there is work to be done....".

Steel production and consumptions levels are indices of national power.

While United States of America Steel Consumption per capita is in excess of 700kg, Japan about 500kg, Nigeria's steel consumption per capita is sprawling 25kg in the 21st century. Demand for steel in Nigeria is astronomical but no steel.

We should know the truth, and that is that **"Steel is Strategic for Nigeria's industrial development. Playing tricks with Steel Development in Nigeria is playing tricks with Nigeria's Industrial Development life and it is playing tricks with our present children and those unborn. To be forewarned is to be forearmed"** Enough is enough for the Nigerian Steel Industry.

*A plea is for the Federal Government of Nigeria and Nigerians (leaders, policy makers and ordinary people) to sincerely separate those who build from those who destroy because **FUTURE GENERATION WILL JUDGE US ON WHAT WE BUILD AND NOT WHAT WE DESTROY.***

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