



Science

## **THE IMPERATIVE OF IRON AND STEEL COMPLEX – AJAOKUTA**

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### **Abstract**

Steel Complex constitutes the substratum of industrialization, without which attempts at industrial development remain a pipe dream, bleeding resources of a nation and ensuring the transfer of resources to the declination of developmental efforts.

**Keywords:** Steel Complex; Ajaokuta.

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### **1. Introduction**

This paper seeks in part, to raise issues that may serve as starting points of a continuing debate, to shape the developmental and industrial architecture of Nigeria.

Nigeria has been faced with trying economic times for a long time, but the current grueling economic experience throws up opportunities to have a good grasp of some of the reasons undergirding the situation and the need to develop an interconnected economy, whose internal dynamics would be such that, one industry’s product is another’s input

All commodities directly or indirectly utilize iron and steel. The very implements required for the development of productive forces depend on iron and steel. Whether working agricultural fields, building industries or moving products from one location to the other, iron and steel is utilized (Daniel, 1970). No nation has broken into the technological age (Dos Santos, 1970) without an iron and steel complex. The power status of any nation and the living standard of its people is directly hinged to its level of technological development (Dahlman, 2004:15). Ajaokuta steel complex is located on 24,000 hectares of land (Dolgov, 1983) with the steel plant built on 600 hectares.

### **2. Background**

The idea of large-scale steel production was first mooted in 1958 (Ikoku, 2006:1), but dismissed by foreign interlocutors as not feasible (Galtung, 1971:8). However, proposals were received from

various countries for 100,000 tpa and 200,000 tpa capacity plants (Agbu, 1992:26). The concept of the Nigerian Council for Science and Technology (NCST) was for establishment of steel rolling mills. Between 1960 and 1967, the Nigerian Government invited proposals on the feasibility of establishing an integrated steel plant. Proposals were received mainly from Britain, Westinghouse and Koppers of USA, Stelco Lurgi, Demag, Germany, Sofresid of France, Inert-Consultancy of Switzerland, Canada and USSR (Ogban-Iyam, 1988: 69). The verdict? Time was not ripe (Gantrel, 2004:10), since the cost of technological and associated infrastructural development would be prohibitive (Galtung, 1976:14), lack of domestic market (Galtung, 1976:14), absence of coking coal, non-availability of suitable technology (Helleiner, 1975:3) in addition to overriding diplomatic and economic interests (Spero, 1979:9). Only the USSR gave an affirmative, realistic and encouraging proposal. In 1965, Nigerian Steel Associates and Westinghouse and Koppers of USA, formed a Joint Venture Company that fell through. A UNIDO study of 1967, cited Nigeria as possible steel market. In 1970, contract was awarded to Tiajpromexporte (TPE) of USSR to determine the quantity and quality of iron ore, coking coal, limestone, dolomite and refractory clays necessary for a steel complex project. The National Steel Development Agency (NSDA) was established by decree No. 19 of April 14, 1971 to plan, construct and operate steel plants, do geological surveys, market studies and metallurgical research. NSDA did historical and future consumption pattern and proposed a plant capacity of  $2.6 \times 10^6$  mta while TPE proposed  $1.3 \times 10^6$  mta to start off with mixed products – flat and long. Sofresid of France wrongly advised against mixed flats and long and suggested all Long, even though Nigeria's requirement for flat was 55%. The ill intent of this advice can be appreciated in the high value chain of flats which are needed in automotive, reactors, mechanical and plant engineering, and consumer goods (Obaro, 2001:25). It is on flat sheets that high international competitiveness of a large number of steel-based value chains depend. Nigeria's steel imports are – 58% flats, 20% beams, 20% rods and others. British steel 'experts' wrongly described Nigeria's coal as non-cokable whereas Lafia and Obi coals are cokable. These are known deposits and there are yet-to-be-discovered deposits. International actors through their agents exercise powers in developing countries by two means:

- 1) Use of co-operative mechanism-aid co-ordination
- 2) Strategic dissociation from its project administration.

The first method of power is designed to increase influence over governments in general and the second to enforce control over its project administration. Scientific knowledge is highly concentrated on the wealthy corporations, states and developed world. Africa does not even have a marginal share of this control but is only a consumer whose role is essentially the less dignified one of scavengers. Marginalization and domination is inherent in scientific dependence (Ake, 1991:7)

Nigeria's ability to pursue national goals has been constrained by "unholy alliance" between the managers of our economy and foreign interests (Shaw & Fasheun, 1980:18). "State officials" have been either 'genuinely ignorant' or 'consciously collaborative' with foreign interests to undermine national interests (Beckman, 1982:23), (Okongwu, 2007). Production of mixed flat and long, was to start initially at  $1.32 \times 10^6$  as stage 1 to  $2.6 \times 10^6$  as stage 2 and  $5.2 \times 10^6$  on completion. In 1973, NSDA asked TPE to prepare preliminary project report on Ajaokuta which lead to detailed project report same year.

Phase 1: 1 Plant: 2 batteries of 49 coke ovens each, to make  $9 \times 10^5$  ta of coke.

1 Plant: 2 Sintering machines to produce  $2.64 \times 10^6$  ta.  
1 Plant: 1 Blast Furnace to produce pig iron  $1.355 \times 10^6$  ta  
Lime Plant:  $9.1 \times 10^4$  ta  
By-Products: To process by-products of coke ovens – dehydrated tar,  
ammonium sulphate etc.

Steel- Making Plant: 2 LD converters, 135t capacity each  
3 four-strand continuous casting machines.

Complex: Billet Mill  $7.9 \times 10^5$  ta  
Medium Section Structural Mill  
Bar Mill  $4 \times 10^5$  ta  
Wire Rod Mill  $1.3 \times 10^5$  ta

There was proposed early expansion to  $2.6 \times 10^6$  ta half flat sheets  
culminating in  $5.2 \times 10^6$  ta final expansion of flats and heavy.

The report was submitted in 1977 and accepted in 1978 with modifications. In July 1979, a delegation led by Major General Musa Yar'Adua, Chief of Staff Supreme Headquarters, met with high level Kremlin officials and a contract was signed with TPE. In 1979, NSDA was broken up and Ajaokuta Steel Company Limited (ASCL) emerged. TPE was contracted to design, build and equip ASCL.

In 1980, the Western firms, who all along were opposed to ASCL were inducted into and doomed the project. With their entry, the stage was set for conflicting ideological, cultural, professional and economic views (Alabi and Akindele, 1989:8). The new actors and their tasks were:

- Bilfinger, Berger, Dumez of Germany and Fougerolle of France for civil works
- Wimpey – Metallurgical Training Complex
- Boskalis – River Port

In addition, Pan African Consultancy Service Nigeria Ltd and Metallurgical Consultants of India Ltd (PAC-MECON) were supervisors.

Within 2 years of construction starting, work stopped and the Western civil contracting firms opened up renegotiations. It is important to note that contracting the civil works to Western firms meant that the rate of work at ASCL was dependent on and determined by the rate of completion of the erection base which falls under civil works on which, process equipments are to be mounted. This framework renders the installation of the process equipment subject to the civil works. Shortly, we shall see a reenactment of this counterproductive framework, in 2016, in the proposed 'agreement' with Global Steel Holdings Ltd of India.

Beginning in 1980, ASCL was to be completed in 54 months. On Phase 1, =N=100b was spent, even though initial estimate was =N=3.5b (Yinka, 2004:19). The cost of the Metallurgical School was revised from =N=29m to =N=70. In 1987, the World Bank slammed the non-cost-effective route of Nigeria's steel development, describing it as exceptionally high. In 1983, the finishing mills for light rod and light section was commissioned and full plant integration was achieved in

1990. As at October 1993, Ajaokuta was 98% completed and engaged over 1000 Russians and 3,500 Nigerians directly. In 1994 TPE pulled out when Nigeria failed to meet its obligations.

### **3. Exogenous Experience and Lessons**

Since the 1970s, there have been non-fruitful attempts at a functional Ajaokuta Steel Complex. In spite of all the self-inflicted problems, it has trudged on. Other steel complexes in various countries – Korea, India, China, Egypt etc - built by the same company Tiajpromexport (TPE) of Russia, have thrived and the nations propelled into the industrial age. In 1976, the World Bank stated that steel industry in India, South and North Korea were not feasible. The Asians rightfully ignored the World Bank and went ahead with their project and the rest they say is history. China accounts for over 60% of Asia's steel production and remains the world's largest producer and largest consumer courtesy of TPE with the blast furnace technology. The World Bank and the international steel consortium have succeeded with Nigeria through bureaucratic collusion and the ruling elite. The USSR set up steel plants in Algeria, Egypt, Pakistan, Iran, India (Bokaro, Bilai), Iraq, Turkey, Sri-Lanka, Bulgaria, Rumania, Yugoslavia Finland etc. While other nations harnessed their steel asset Nigeria allowed her's to flounder. From the same Canada, which could not manage the Transmission Electricity grid came the suggestion from Hatch Associates of Ontario that ASCL be discontinued and utilized for power generation. The captive thermal electricity plant at AJSL has a capacity of 110 MW (55 MW x 2) to power 43 plants. In addition, there is a 330 KVA double circuit transmission line from Benin City and a 330/132 KVAA substation at Ajaokuta. Total reliance on international steel company can lead to the sacrifice of national objectives, as happened in India with respect to Bokaro Steel project. In the Indian Bokaro plant, the U.S. identified initially with the massive steel project only to opt out for the Soviets to take over in 1955.

### **4. The Current Situation**

Ajaokuta remains mired in inertia, not for lack of skilled manpower. Even if that were the case, the existential condition that we faced in the 50 years since its inception is more than enough to produce the requisite high skilled personnel. All things iron and steel are hinged on imports and this applies to private smelters, who depend on scrap, whose origin is external to start with. Aggregation of resources transferred would have built Ajaokuta many times over. In as much as we may not realize it, a significant reason for our undevelopment is in part the non-completion of Ajaokuta Complex. It would have provided the basic raw material inputs for smelters within and establish the basis for Nigeria's and Africa's industrialization and economic integration. Thousands of Nigerian Engineers produced annually by our institutions could have found useful work within and outside Ajaokuta. All the while, Ajaokuta was toyed with and consistently, we sought others to run it for us, in the mistaken view, that that would confer expertise transfer. If for as long as we adopted the same misbegotten action Ajaokuta has remained the way it is, doesn't it call for a rethink? Doing things, the same way begets the same result. In the meantime, we are off again on the same outmoded non-solution of seeking a concessionaire. Mastery of scientific/technical development derives from hands-on approach. Errors are made and lessons learnt. There is no other way! There are competent, highly-skilled and brilliant minds of Nigerian stock that can run Ajaokuta for the nation successfully. The most recent case of the mistaken road down which we have avoidably trudged being reenacted, is the current hawking of Ajaokuta, which was only recently 'regained'. Having been stuck in a British court for eight years – 2008 to

2016 - after its mistaken concessioning to Global Steel, which by the way is a Company of Indian origin, our experience suggests that we keep and have our best minds run it with benchmarks set and given a free hand to practice profitably their craft, having put in place a feedback mechanism to determine if set targets are being met. With the international mediator, Philip Howell-Richardson the 'agreement' reverts ASCL to Nigeria, while Nigerian Iron Ore Mining Company (NIOMCO) is retained by GSHL under existing concession agreement, but with ASCL and Delta Steel Company Ltd (DSC), gaining priority access to the iron ore from NIOMCO. Concession to government 'raised' from 3 to 4% of turnover. A payment of \$700m is to be paid GSHL for revocation. What an agreement! The very raw material that Ajaokuta requires for its operation is left in the hands of extraneous GSHL which can determine the fate of ASCL. We should bear in mind that with passage of time every installation deteriorates. So, the later we take control of Ajaokuta, the more inoperable it becomes and the greater the liability. Taking charge and running Ajaokuta by ourselves will mean investing to get it operational, maintaining and upgrading as necessary, thereby improving the value of the asset. A concessionaire's interest is profit, getting the maximum value at minimal cost without regard to post concession time. In fact, a question: what happened to Delta Steel? If our best brains and minds are given benchmarks and the necessary capital invested, with feedback mechanisms as to whether set targets are being met, we shall get results.

A 'contract' is said to have been negotiated with China Engineering Construction Company (CECC) to build the Lagos – Calabar railway for \$9.2 billion. Like we know, a major aspect in a project is maintenance. If the wherewithal for a project has not been domesticated, maintenance of same remains in the hands of the builder turning an otherwise potential asset into a long-term resource-draining liability. With this knowledge, the current arrangement may need a rethink. On the other hand, the initial builders of Ajaokuta, TPE, could be got to complete the project, with the right financial arrangement, given that prudent borrowing to finance the productive aspect left, will pay for itself, induce the necessary knowledge and know-how in Nigerians and imbue us after the project with the attributes to replicate on our own; given that a steel factory provides the material to build itself and other factories. Let it be understood that CECC is a State- Owned Enterprise (SOE), just like Ajaokuta is now. So, that Ajaokuta has not performed up till now is not because it is a SOE; the answer may be better found in the character of government. This is where the anti-corruption stance, of the current administration, becomes critical to national development

Rather than see projects as stand-alone, linkage to other aspects should be the dominant consideration. The \$9.2 billion slated for the Lagos – Calabar railway can be accomplished for a fraction of the cost, by tying the railway construction to Ajaokuta. Let Ajaokuta produce the steel rails along with the bolts, while CECC supplies the expertise. Getting our best minds to work along with the experts would rub-off on us, such that part way into the project execution, the mechanisms and the intricacies would have been understood inside out. To ensure certitude, a mini project could be going on in tandem, by Nigerians, some of whom are products of the current project. In that way, errors made can be duly worked out and corrected, with the experts still on ground. Now, for the spin-offs: before completion of the project, Nigerians would have taken charge and by the completion of the project, other railway projects would be executed by us and Nigeria would then become the railway infrastructural destination for the rest of Africa, to start with. Giving Ajaokuta to an external concern will deny us all these benefits and more. More still, major infrastructural facilities would depend on Ajaokuta for their fabrication and repairs. The infrastructural backbone

of industries is not shelf-items and as such, parts have to be custom made. That current void and enormous foreign currency expenditures would have been filled by Ajaokuta. In fact, Nigeria's refineries, just like all other industries in Nigeria, are hobbled by the non-completion of Ajaokuta (Unuigboje 2016).

We have dwelt at length on Ajaokuta because all industries and industrialization remain hobbled and diminished in its absence. Major equipment components in industry are not shelf items and need to be fabricated to fit, so, as an example, our refineries will remain constrained to the extent that its refurbishment is not tied to Ajaokuta. It is also pertinent to realize that the process of coking coal at Ajaokuta, could have set in its wake a subsidiary petroleum process and allied chemicals – xylenes, aromatics etc.

To deride Ajaokuta's reduction process as obsolete may be non-contextual and reflective of lack of awareness of prevailing reduction modes in the world. Contextually, there are essentially two reduction methods – indirect and direct. Indirect open-hearth reduction with coal is the prevalent reduction mode with a technology that is relatively simple and more attuned to our stage of development. Ajaokuta is situated apropos to the Benue trough's coal deposits. Aladja, on the other hand, is contiguous to Warri Refinery (and gas supplies) which generates hydrogen as waste that feeds into Aladja's direct reduction process. It is also pertinent to know that both facilities are hobbled even though one is a durable, effective, time-tested old technology and the other the state-of-the-art. Cognizance needs to be taken of the fact that Itakpe iron ore on which Ajaokuta depends for its input, has 38% iron content, which can be economically beneficiated to 63%. The direct reduction method is amenable to iron ore content of 66% iron.

## **5. Recurrent Versus Capital Expenditure**

The finances deployed to recurrent expenditure, especially to political operatives, is not sustainable. The difficulty in meeting payments for a basic requirement such as salaries and the move on pension funds etc. suggests the need for a review of the disproportionate, indefensible and unsustainable emolument to politicians and its alignment with the general remuneration in society. In so doing, the quantum of funds so freed-up could then be deployed into capital investment. The undevelopment of the nation's productive forces is an existential threat. The pervasive insecurity derives in part, from inability to provide gainful employment for our teeming youth population, given our national median age of 17 years. This youth bulge may be better addressed through industrialization.

Private industry/enterprise is concerned primarily with profit. Any development that results therefrom is incidental. It is government that concerns itself with socio-economic development of society and the interplay of interconnected factors. Capital is concentrated in the hands of government and the provision of jobs to ameliorate unemployment through public works is time-tested. The lessons learnt from the world is that later-emerging nations have capital concentrated in the hands of the state. This confers an obligation on the state to drive the process of industrialization and hence successful emerging nations, especially after the grounding of industrialization in the in the First World, have had governments playing direct industrialization roles to leap-frog their nations industrialization. We have played a junior partner role for too long that got us to this avoidably undeveloped and unenviable position.

## 6. Conclusion

Enacting a development template of converting available raw materials to industrial feedstock is imperative. In the process, derived knowledge is domesticated, leading to interconnectedness of industries as one industry's finished product serves as another's input. This is going to be a painstaking slow process, which initiated, develops the necessary internal dynamics to propel the economy on a path of true development. There is a developing solution to refined petroleum challenges, unfolding right before us in the creeks of the Niger Delta – primordial modular refineries. There is need to make this activity legitimate, by leveraging on the locally developed technological process, to meeting a national deficit in refined petroleum products. Like all developmental processes, there will be problems associated with the process, whose solution will provide opportunities for further development. Direct involvement of governments in running industries is evident in Air Bus which is run by a consortium of European nations. Countries lacking in basic raw materials develop and control their exploitation, at their geographical location, and move the materials to their nations for further processing, where exogenous. In that way, their technological advancement is assured. There is no reason why ALSCON should not produce the aluminium conductors for our power infrastructure and other things aluminium. For too long we have contributed to our undevelopment, and there is need to effect a paradigm shift to resolve the existential threat confronting us through industrialization.

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