

A professional portrait of Prof Linus Asuquo, a middle-aged Black man with a receding hairline, smiling warmly. He is wearing a dark navy blue suit jacket over a light blue button-down shirt. A vibrant red pocket square is tucked into his jacket. On his left wrist, he wears a gold-toned watch with a white dial and a dark leather strap. He is also wearing a ring on his left hand. The background is a solid, dark brown color.

**Rise in Mining sector
GDP from 0.33% in
2015 to 8.9% in 2018
evidence of economic
diversification**

| Prof Linus Asuquo,
DIRECTOR GENERAL, NMDC

Mining sector's DGP rise from 0.33% in 2015 to 8.9% in 2018 evidence of economic diversification

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Professor of Metallurgical and Materials Engineering, Linus Asuquo, is the Director-General and Chief Executive of the National Metallurgical Development Center, Jos.

In this exclusive interview with Mining In Nigeria Media Crew, the Harvard scholar discusses the commitment of the Buhari administration to the development of the Nigeria steel sector, stating that the recent MoU between Nigeria and the Russian Federation for completion of Ajaokuta Steel Company is a landmark development that will yield desired results.

“Government had also obtained a credit facility from the World Bank to fund the mineral sector through the Mineral Sector Support for Economic Diversification Project (MinDiver) with the objectives of improving the attractiveness of the Nigerian Mining Sector as a driver for economic diversification and creating a globally competitive sector capable of contributing to wealth creation,” he said.



Kindly tell us about yourself and service prior to your appointment as Director General of the National Metallurgical Development Center.

I was born on March 18, 1954 in Mbakltam III, Itu in Akwa Ibom State and attended Practising School, Uyo, now University of Uyo where I graduated in 1965. I also attended Holy Family College, Oku-Abak between 1968 and 1969, and St. Patrick's College, Calabar between 1970 and 1972. I then taught Physics, Mathematics and Chemistry briefly at Christian Technical College, Oyubia, Oron in 1973, before proceeding to College of Technology, Calabar between 1973 and 1975 from where I obtained London G. C. E. (Advanced Level). After that, I taught Chemistry and Mathematics briefly at Immaculate Conception Secondary School, Itak in 1976. In the same year, I obtained the Bureau for External Aid Scholarship to study Metallurgy in Technical University, Kosice in the then Czechoslovakia, and graduated in 1982 with M.Sc Distinction and also as Best Graduating Student in the University. I returned to Nigeria in 1982 and did National Youth Service between 1982 and 1983 at Delta Steel Company, Aladja, Warri.

I joined the Federal Polytechnic, Idah, Kogi State as Lecturer II in 1983 from where I went to Anambra State University of Technology, Enugu for my Ph.D which I successfully completed in 1990. I was the first Ph.D graduate of Engineering of the University.

Between 1989 and 1990 I was a Research Fellow in South Dakota University of Mines and Technology, Rapid City, South Dakota, USA. I returned to Federal Polytechnic, Idah in 1990 and rose to the position of a Chief Lecturer in 1994. Between 1995 and 1997, I was the Director of School of Metallurgical and Materials Technology of the Federal Polytechnic, Idah in Kogi State.

In 1997, I transferred my service to the University of Uyo, Uyo, Akwa Ibom State as a Senior Lecturer in Metallurgical and Materials Engineering, and was appointed the pioneer Acting Head, Department of Mechanical Engineering in the same year by Professor Fola Lasisi, the then Vice-Chancellor, University of Uyo. In 1998, I was appointed

'Policy makers providing credible direction for mining sector'

the Coordinator of the Faculty of Engineering, a position I held till 1999 when I became the Vice-Dean of the Faculty of Engineering. In February 2000, Professor Akpan H. Ekpo, the then Vice-Chancellor, University of Uyo appointed me the Acting Dean, Faculty of Engineering, and on the 20th of July 2000, I was appointed the first Special Adviser on Science and Technology to the Government of Akwa Ibom State by His Excellency, Arc. (Obong) Victor Attah, former Governor of Akwa Ibom State. I was responsible for effective and profitable management of the Bureau of Science and Technology where I provided credible direction and coordination in the formulation and execution of the information, communication, Science and Technology policies in the State. It is worthy of note that Akwa Ibom was the first State in the country to create a Bureau of Science and Technology where I evolved a platform for the establishment of a Research and Development (R&D) oriented University, Akwa Ibom University of Technology (AKUTECH) which is now the Akwa Ibom state university. In 2003, I was appointed Honorable Commissioner for Science and Technology in Akwa Ibom State by His Excellency, Arc. (Obong) Victor Attah. I used that opportunity to expand ICT capacity for productivity improvement in Ministries, Departments and Agencies in Akwa Ibom State.

I also built capacity for young school leavers for direct self-employment in services such as Web-design, VSAT, Network and Data Management. I was responsible for human capacity development in the State through the Victor Attah Digital Opportunities Centre (VADOC). I was also involved in the design and building of a Science Park to provide the needed infrastructure for IT, R&D and Software development and production.

I was at the prestigious John F. Kennedy School of Government (KSG) at Harvard University, Boston, Massachusetts, United States of America in 2006 where I obtained a Certificate in Science, Technology and Innovations.

I returned to the University of Uyo in August, 2007 and was appointed Acting Head, Department of Mechanical Engineering in January, 2008. I held that position till January 2011, when I was appointed the Acting Dean of the Faculty of Engineering by Prof. (Mrs) Comfort Ekpo, the then Vice-Chancellor,



Two tonne batch lead smelting pilot plant

University of Uyo.

I was promoted Associate Professor in October 2010 and Professor of Metallurgical and Materials Engineering in October 2013. I became a member of the University of Uyo Governing Council in 2017.

I have promoted the growth of the metallurgy profession in Nigeria, and had served as the President of the Nigerian Metallurgical Society between 2009 and 2012.

I am a Fellow of the Nigerian Society of Engineers, a Fellow of the Nigerian Metallurgical Society, a Fellow of the Institute of Quality Assurance of Nigeria and a Fellow of the Nigerian Institute of Industrial Administration. I am registered with the Council for the Regulation of Engineering in Nigeria (COREN).

I became a fellow of the International Association of Research Scholars and

Administrators in 2019. I am also a council member of the Association.

I have written many books, the most outstanding being Foundry Technology, Science and Technology in Akwa Ibom State: Visions and Perspectives, Transforming the Landscape of Akwa Ibom State through Science and Technology and Wealth Creation through commercializing Science and Technology Innovations in Akwa Ibom State.

I was conferred with Fellow of the Nigerian Academy of Engineering in June 2018 and in July of the same year, appointed Director General/Chief Executive of the National Metallurgical Development Centre by the President of the Federal Republic of Nigeria, Muhammadu Buhari, GCFR.

I am a beneficiary of many International, National, State and Community awards and have to my credit, numerous

‘ASCO: President Buhari’s choice of the Russians underscores commitment to revitalization of steel sector’



MP-AES Machine

publications in international, national and referred journals and books and hold a patent on a cassava processing machine. I am a Pastor of the Redeemed Christian Church of God and was the Chairman of Christ the Redeemers Friends International, Akwa Ibom Chapter and the Chairman of Akwa Ibom Province 1 Mission Board. I am now the Chairman of Christ Redeemers Friends International, Jos.

I am well-travelled and am married to Mrs. Felicia Linus Asuquo and blessed with children.

Kindly discuss the commitment of the administration of President Muhammadu Buhari to the development of the metallurgical industry in Nigeria. When you talk of the metallurgical sector, you are talking about almost the entire minerals sector value chain and not necessarily only the iron and steel sector. But let me start with the iron and steel industry. We all know that the Ajaokuta Steel Company Limited was envisaged to be the largest iron and steel complex in the country. It was designed as an integrated steel industry

with capacity to produce 1.3m tonnes of long products in the first phase which was to be upgraded to 2.6m tonnes of products, including flat sheets in the second phase and 5.2m tonnes in the third and final phase. The Ajaokuta Steel Company was also to provide billets, which is an intermediary product for the three in-land rolling mills in Jos, Oshogbo and Katsina.

We are all aware that several efforts by previous administrations to complete and operate the steel plant ended in failure with some of the partners even taking the Federal Government to court, but I believe that all the problems Ajaokuta Steel Company is facing will soon be in the past. The President and Commander-in-Chief of the Armed forces of the Federal Republic of Nigeria, His Excellency, President Muhammadu Buhari, in a landmark development signed an MoU with the Russian President to, among others, complete the Ajaokuta Steel Company Limited. Let me point out that this is significant because the Russians, when they were the Soviet Union, were the ones who

handled the erection of the entire steel plant through their company called Tiaj-Prom-Export (TPE). Experts in the steel sector have for long been calling for the engagement of the Russians to complete the plant and this action by the president, I believe, is a turning point. The completion and full-scale operation of the Ajaokuta plant will create over 2m direct and indirect jobs and serve as a catalyst for industrial and technological development.

The metallurgical industry also comprises the non-ferrous sector made up of tin, lead, zinc, copper, etc. which are abundant in Nigeria. Because of the need for government to diversify the economy several efforts are being made to support the sector. The metallurgical industry bill is at the national assembly awaiting passage. The bill aims to regulate the metallurgical industry and fast track its development. Government had also obtained a credit facility from the International Development Association (IDA) to fund the mineral sector through the Mineral Sector Support for Economic Diversification Project (MinDiver) with the objectives of improving the attractiveness of the Nigerian Mining Sector as a driver for economic diversification and creating a globally competitive sector capable of contributing to wealth creation, providing jobs and advancing social and human security. This complements the Solid Mineral Development Fund established under the Minerals and Mining Act 2007 to provide funding and interventions in the key segments of the mining sector value chain. These measures have continued to make significant impacts in the sector, with the sector’s contribution to GDP rising from 0.33% in 2015 to 8.97% in 2018.

All these are pointers to the Buhari government’s commitments to the development of the metallurgical industry in Nigeria.

The Federal Government is beginning to focus on the solid mineral sector as a strategy to achieve economic diversification agenda of the Buhari administration. How is the NMDC Management contributing to the realization of this set goal?

‘Completion and operationalization of ASCO can create over two million jobs’

NMDC is the federal government agency mandated by law to carry out research work for the development of the minerals and metals sector. Its role, among others, is to develop processes for value addition in the minerals value chain, especially at the processing and fabrication stages of the value chain.

Nigeria presently is not deriving full benefits from its mineral resources. The mining industry is still at its initial stages of development and value addition activities are limited to the concentration of ores for the export market. Subsequent value addition activities, i.e. extraction, alloying, fabrication, manufacture of components, etc. are almost non-existent in this mineral sector.

NMDC is at the forefront of changing this narrative by pioneering research efforts to encourage value addition practices in the sector. To this end, it has installed a 2-tonne batch capacity Lead Smelting Pilot Plant for pilot research studies aimed at the adaptation of existing technologies for the production of lead metal from local deposits of lead ore. Lead/Zinc ores are presently mined and exported as concentrates with benefits of value addition lost to foreign countries. NMDC is making similar efforts with respect to cassiterite (tin ore), ferro-alloys, tantalite, columbite and even iron ores.

By improving mineral beneficiation processes and developing further value addition processes, it is expected that local and foreign entrepreneurs will be encouraged to invest in the extraction and fabrication aspects of the minerals industry. This will lead to the realization of the full benefits the sector can offer, thereby making the sector create more jobs, wealth and help in reducing poverty. The share of the sector in Nigeria’s GDP will also increase thereby helping to diversify the economy.

What is the short-term vision for the NMDC in terms of revenue generation, i.e. what percentage increase in revenue generation do you foresee on the short run?

We are working to see that the basic requirements for the conduct of research work are provided for the highly skilled personnel at NMDC to do their work. Here, I am talking about adequate and

stable power supply, water supply, chemicals and reagents for analysis, etc. We are also sparing no efforts to see that broken-down research equipment are repaired and new ones procured to replace obsolete ones. These efforts are geared towards fulfilling our mandate, assisting government’s policy of economic diversification and revenue generation. I believe that with equipment and utilities adequately provided, NMDC will be in a very good position to increase revenue generation.

We are also making efforts to partner and collaborate with relevant industries and institutions of higher learning including government agencies to offer our services as required. We hope to leverage on our uniqueness and expertise to generate income through such collaborations.

I don’t want to give a specific figure but I believe that in no distant future, we could increase the revenue we generate by two or even three-fold.

On the long run, how would NMDC

contribute more significantly to the mining sector revenue?

Like I said earlier, NMDC’s role in the mining sector is to develop better method of mineral beneficiation, adaptation of technologies for the extraction of desired mineral constituents and carrying out research in further metallurgical processes like foundry technology and other metal forming processes. This way, NMDC aims to generate data and develop the know-how for advanced value addition processes, thereby taking the mining sector in Nigeria to the next level. This will encourage operations in the sector to invest in setting up smelting plants and other down-stream industries leading to job and wealth creation, increase in revenues and higher GDP.

In terms of metallurgical development, kindly discuss the achievements of your agency

The NMDC was initially set up to conduct research work in the characterization and development of raw materials for the iron and steel industry being established in the country. To this end,



500Kg Electric Arc Furnance

How FG repositioned NMDC for pioneering Research and Development'

NMDC had characterized and developed beneficiation methods for almost all the known deposits of iron and steel making raw materials. These include iron ores, limestone, dolomite, refractory clays, manganese, chromite ores, etc. We have documented these findings in a publication titled "Databank of Raw Materials for Iron and Steel Making". On metallurgical coal (coking coal) which is not available in the country, NMDC has shown, at laboratory scale that a significant percentage of local coals (15%) could be incorporated in a blend with imported prime coking coals. Further research in this area is continuing.

Research work that informed the installation of the concentrate line for the production of iron ore super-concentrate for Delta Steel Company (DSC) Limited, Aladja at the National Iron Ore Mining Company (NIOMCO) Aladja was also carried out at NMDC. The requirement for DSC was thought to be met only through importation.

NMDC had installed two 500kg Electric Arc Furnaces for pilot research aimed at the development of steels for various applications. The furnaces will be fully operational as soon as certain auxiliary equipment and facilities are put in place.

Other contributions made by the NMDC include mechanical tests and metallography, failure analysis and the assessment of construction bars on the Nigerian market.

How would you commend the leadership style of the Hon. Minister and Minister of State, MMSD, Arc.OlamilekanAdegbite and Dr. Sampson Ogah?

Our two ministers are highly intelligent and hard-working young men who have hit the ground running. Both of them are result oriented and have proven themselves in various endeavours before their appointments as ministers by the President. The Hon. Minister of State was with us at NMDC on the 14th of November on a working visit and both of them were with us during the retreat in Kaduna. I have the feeling that a lot will be achieved during their tenure in the ministry. We at NMDC stand ready to work for the success of their tenure.

The Buhari administration encourages private sector participation in national development. What opportunities

exists for collaboration with NMDC and how can it create jobs for Nigerians?

Stakeholders in the mining sector in Nigeria are largely artisanal operators who learned their trade by working with others. They need the input of technology if they are to operate sustainably, i.e. in an economically viable and environmentally friendly manner. NMDC stands willing and ready to partner with operators in the minerals and metals sector to guide them and offer the technical know-how for them to operate sustainably.

The services the Centre can offer include minerals identification and characterization, beneficiation studies and further value addition studies in extraction and forming.

What opportunities exist for young entrepreneurs in the Metallurgical industry?

The metallurgical industry offers a lot of opportunities for young entrepreneurs. Nigeria consumes about 8 million tonnes of steel/year and produces only 2 million tonnes. This shows that 6 million tonnes of steel is imported. In other words, there is a 6 million tonnes market for any entrepreneur willing to set up a production facility. Similarly, any entrepreneur willing to set up plants for the production of tin, lead and zinc metals will discover that there is a ready market because Nigeria's requirements for these metals are met only through importation. No plant, as yet, produces these metals locally. There is also a ready market internationally as these

metals are traded at the London Metal Exchange (LME).

The wider mining sector also offers a lot of opportunities to young entrepreneurs as demand for various minerals are strong world-wide, especially in China. Minerals like Lead/Zinc, Tin, Columbite and Tantalite, etc. have made many young entrepreneurs rich in this country.

In terms of consultancy on metallurgical matters to operators and revenue generation in view of the consultancy services, what is your outlook for 2020?

Consultancy services in the mineral, metals and allied sectors present an area of opportunity for the Centre to enhance its revenue generation in the year 2020. This is in view of government's increased commitment to the mineral and metals sectors in its determination to diversify the economy away from oil. NMDC offers consultancy services in mineralogy/mineral processing/beneficiation: ((lead/zinc), columbite/tantalite, cassiterite, iron ore, etc.)), manpower development, tin smelting, failure analysis (forensic metallurgy) and environmental protection in the mineral and metal sectors among others.

NMDC is going into 2020 with more operational research equipment and newly acquired state-of-the-art analytical equipment that will enhance the Centre's capacity to offer research and development and consultancy services to the metallurgical sector. This will naturally result in an increase in revenue generation to the Centre.