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Sustainable Livestock Development for Food Security in Nigeria: The Role of Technological Innovations

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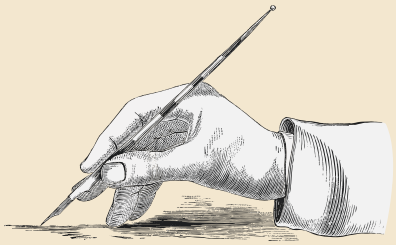

The Nigerian Society of Engineers

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We strive to:

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ii) foster strategic collaboration with government, industry, academia, and society to influence policy, drive national development, and promote public trust in the engineering profession;

iii) meet all applicable statutory, regulatory, and stakeholder requirements, including the evolving professional needs and expectations of our members;

iv) ensure continual improvement of our quality management system through data-driven decision-making, effective leadership, and inclusive member engagement.

This policy provides the foundation for our quality objectives and reflects our unwavering dedication to operational excellence, professional relevance, and national development.

Signed_____

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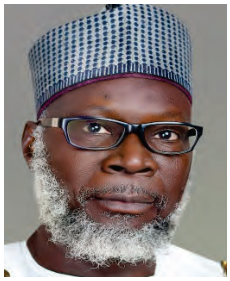

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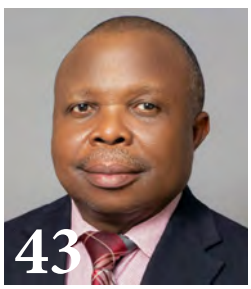

Editorial

Engr. Felicia Nnenna Agubata, PhD, FNSE
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When people think of engineering, they often picture bridges, skyscrapers, and power plants. Rarely do cows, pastures, or milk come to mind. But in today's Nigeria, the future of food security may well depend on how boldly we apply engineering solutions to agriculture particularly livestock development.

For decades, Nigeria has grappled with herder-farmer conflicts driven by myriad factors including pressure of diminishing land and water resources. These conflicts, deeply rooted in traditional free-range systems, have led to regrettable consequences including loss of lives and displacement of communities. Sharp decline in agricultural productivity is a direct consequence of protracted conflicts.

Food security is under threat as well as peace, and economic growth.

That is why the Nigerian Society of Engineers (NSE) has chosen a timely and urgent theme for this quarter's edition: "Sustainable Livestock Development for Food Security in Nigeria: The Role of Technological Innovations." It is a call to action; to re-engineer farming in Nigeria.

Today, engineers are offering hope and solutions as demonstrated by transformational facilities like solar-powered boreholes for remote grazing areas, sensor based monitoring of animal health, data-driven feeding systems and drone-assisted pasture management etc. These technologies are not science fiction—they are already being used around the world.

Nigerian engineers are leading the charge in adapting them to our local context.

However , to make these solutions work optimally, we must think differently. Farming is no longer just a tradition; it must become a science-driven enterprise. This means bridging the gap between engineers and farmers, between academia and industry, and between innovation and policy. It also means recognizing the value of local expertise and investing in homegrown ingenuity that reflects the unique challenges and strengths of Nigeria.

Under the visionary leadership of Engr. Margaret Aina Oguntala, FNSE, the NSE has continued to demonstrate the desire to solve national problems. Her recent engagements on global platforms from the Belt and Road Forum in China, Offshore Technology Conference in Houston, Texas to World Engineering Day at UNESCO in Paris have positioned Nigerian engineers at the center of sustainable development conversations. Domestically, her initiatives in clean energy, capacity building, and youth empowerment show that sustainability is not just a theme; it is a movement.

This edition brings you rich perspectives ranging from modern ranching models and satellite-aided livestock tracking to insights into Nigeria's National Dairy Policy. Whether you are a professional engineer, a policymaker, a student, or simply a concerned citizen, these stories remind us that food is not just a basic need, It is a national security issue and engineering is central to solving it.

So as you turn the pages of this magazine, we invite you to look beyond the cows in the field. See a system waiting to be made smarter, safer, and more sustainable; see the power of innovation not just to feed a nation, but to heal it. I hereby enjoin NSE members to explore this edition as its insights fuel innovation and action toward a sustainable future.

As we approach the 2025 International Engineering Conference, Exhibition and Annual General Meeting tagged "Ibadan 2025", let us harness these ideas to resolve conflicts, ensure food security, and build a transformative engineering culture

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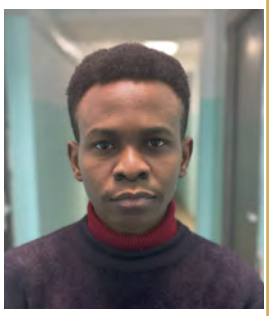

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Sustainable Livestock Development for Food Security in Nigeria: The Role of Technological Innovations

Engr. Johnson Otitolaye, MNSE

Food security is one of the seventeen (17) United Nations' Sustainable Development Goals (SDGs) which were designed to achieve even development among nations of the world in some specific human development areas by year 2030. Specifically, SDG 2 is to achieve 'zero hunger' globally. The main focus of SDG 2 is: ***"end hunger, achieve food security and improved nutrition, and promote sustainable agriculture".*** This is an ambitious goal that every country is expected to put action plans in place for its achievement. The target date of 2030 is not a destination but a passing phase because achievement of food security by this date is expected to be sustained perpetually.

Food could simply be defined as a substance consisting of protein, carbohydrate, fat and other nutrients (minerals) needed by human beings and other organisms to sustain growth and vital processes and to furnish energy. Food for humans are generally available from plant and animal sources which production have been largely controlled by people through agriculture. Generally, agriculture is the active production of useful plants and animals majorly for food in ecosystems that have been created by people. It is the safeguard of food production processes and the guaranty of peoples' hindered access to the final products that is summed up in the concept of food security.

As has been variously defined by experts, food security is the measure of food availability and the ability of a person's access to it. Essentially, it can be understood as aggregate of all the steps taken deliberately to safeguard sources of food items and ensure there is no impediment for people to have access to it at every stage of the complex value chain involved.

The focus of this article is on the role of technological innovations in sustainable ***livestock*** development for food security in Nigeria. The article gives a perspective on the road map necessary for Nigeria to progressively integrate technological innovations into its livestock development strategies.

Livestock refer to animals that are domesticated primarily for food. The most commonly reared livestock in Nigeria are Chickens, Goats, Cattle, Pigs, Sheep and Camels. According to several studies and statistics, majority of these animals are raised in the traditional way of free range production systems owned by smallholders and nomadic herders. In these kind of systems, the animals are either left free to search for food or are guided to forage around the environment. These systems are highly inefficient and yield of require

Figure 1: A cattle ranch operated by the American Cowboys

products such as eggs, meat and milk are comparatively far lower than in modern techniques of livestock production. Aside from low production efficiency, the traditional free range systems are treats to the environments and are the reason for conflicts between plant growers and livestock farmers instead of the two complementing each other to achieve food security. With all the issues surrounding the traditional free range animal production system, it is very clear that it cannot support the concept of food security for the nation. There are many conversations around integration of technological innovation into the livestock production and development programme in Nigeria, its adoption cannot be later than now. This is why the theme of the Nigerian Society of Engineers Magazine for this quarter which is; ***Sustainable Livestock Development for Food Security in Nigeria: The Role of Technological Innovation***s is most appropriate and timely.

Tracing the history of human development, one can opine that adoption of technological innovations in livestock production and development started many centuries ago when the early man was able to successfully domesticate wild animals and grew them for food in an ecosystem he prepared. The method (s) applied to restrain the wild animals and raise them among men certainly involved some sort of technological innovations. Whether it was by trapping, caging or tethering, it was a novel technological innovation given the level of human development at that time. This feat of domesticating wild animals for food was a success to the extent that human population relative to useable land were in tandem, and the ecosystem remained in a balanced state. However, as human population continue to increase so also is the requirement for livestock products continue to increase but, the quantum of useable land seems to remain constant. This was the beginning of a major distortion to the balanced ecosystem. The more the human population the more the ecosystem distortion move towards a critical point. Gradually, skirmishes for land to sustain traditional crop production and livestock production began to surface. To resolve these conflicts, traditional livestock production technique was modified. Instead of raising the animals completely on free range, livestock farmers on traditional small holdings began to cage or tether the animals while food, water and other essentials were provided for them in-situ. Without doubt, this technique was laborious, inefficient and unsustainable. The next resort for traditional livestock farmers was to practice herding of animals such as cattle, goat, sheep, and camel that require large quantity of grass by guiding the animals around to find forage and water where crop production farmers don't operate.

The herding technique worked and has been in practice for many centuries not only in Nigeria but world over. For example, the American Cowboys practiced this technique in the past. At the point when human population all over the world exploded, demand for

food (crop and animal) products escalated, demand for land for infrastructure development jumped thereby making the human-plant-livestock-land ecosystem's distortion caustic beyond redemption. The resultant effect of this was series of large scale fatal conflicts between crop production farmers and livestock farmers. This breaking point led to a paradigm shift from the traditional technique of livestock production in many advanced countries to modern techniques the best of which was livestock ranching method during that era.

The simplest definition of a ranch is; a large tract of land devoted to the breeding and raising of livestock such as cattle, sheep, horses, camel, etc. The land is usually demarcated by some physical structures for separation from other uses. Suitable grass (forage) and water are usually made available in abundance within the land either naturally or are deliberately cultivated for grazing purpose. Ranching essentially resolved the problem of violence clashes between crop production farmers and livestock farmers significantly in places such as Spain and America where it was first introduced. Consequent to this, ranching became a model for livestock farming in many advanced countries. With increase in knowledge, ranching technique had been modified in several countries to accommodate progressive adoption of technological innovations to improve productivity and efficiency in livestock production and management.

Interestingly, ranching is yet to be popular among the large population of traditional livestock herders in Nigeria hence, the persistent violent clashes between herders and crop production farmers in every nook and cranny of the country. This is an important source of insecurity and a big threat to food security in Nigeria. Without a conscientious action in this regard, achieving the objectives of SGD 2 by 2030 may elude the country. To solve this problem, the Nigerian authorities may need to adopt a leap frog approach to adoption of workable technological innovations to livestock development that would in the short term spike up productivity, increase efficiency and remove the persistent herder-farmer conflicts arising from the obsolete free range (herding) technique of livestock management in the country. Although, application of technological innovations in livestock development has reached sophisticated level globally, Nigeria can start from the known and proven techniques and progressively improve on it. To this end, urgent steps are required to be taken in the immediate.

First of all, the traditional pastoralist populace in the country must be encouraged and supported to adopt modern livestock ranching technique which will give room for easy integration of current technological innovations to livestock management in order to shore up efficiency and productivity. Although, ranching technique may not be an end to all problems associated with livestock farming in Nigeria, but by in my reasoning, it would bring immediate benefits in the following ways;

i. It would curb the incessant herder – farmer clashes (as it is commonly called) in the country. Ranches are dedicated stretch of lands for livestock farming which are owned and controlled as a business concern. Under this practice, land and animal security are guaranteed just like in any other business premises. Encroachment by unauthorized person(s) into a ranch becomes illegal. Furthermore, all amenities for livestock management are expected to be available in a ranch, there is therefore no reason(s) for ranch operators to trespass on other lands that are dedicated for other businesses such as crop farming, infrastructure development, etc. It is search for these amenities (forage, water, security, etc.,) that motivates local pastoralists in Nigeria to move randomly with their livestock to wherever they can find them but in the process are unmindful of the attendant cost(s) to existing land users. This often is the cause of clashes between herders and crop farmers because destructive encroachment are often alleged. Ranching technique was first adopted somewhere in Spain and America to resolve similar herder - farmer problems amongst other benefits. It worked then, it should work here in Nigeria too.

ii. It would bring about accountability in livestock ownership. Owner(s) of ranches can easily be identified by the relevant authorities unlike in the free range system in which case herd of cows are moved around randomly by proxy herders while real owners remain largely unknown to authorities. Similarly, accurate head count of roaming livestock (i.e. Cattle, sheep, camel, and such likes) is a huge challenge thereby making government's livestock policy formulation and implementation difficult. The statistics of the number of cows in the country are estimates that are anything but accurate. This may impact negatively on government policies for livestock development. As a hypothetical example, assuming a state or local government authority makes a plan to vaccinate two million cows in a particular year based on projection of the number of cows that are in the locality, but before the procured vaccines arrived the state, additional one million cows have migrated into the state without any records. Obviously, the vaccination programme would fail, productivity would be affected negatively and food security would be threatened further. Ranching technique would make accountability simple both in terms of ownership and statistics of number of cows.

iii. Adoption of ranch technique would improve the livestock health and increase

productivity significantly. Animal health management in a livestock ranch is easier to accomplish than in the traditional free range system. Animal health plans and administration can be done scientifically with accurate records in a ranch. Also, environmental impact on the livestock can be determined once and for all since it is not likely to change significantly at a fixed location unlike when the animals have to constantly move to new locations with new environmental impact on the health of the animals.

iv. Ranching technique in place of the traditional free range method would enhance easy integration of technological innovations into livestock management in Nigeria. In a ranch system, technological innovations such as automatic feeder, automatic milking machine, automatic animal health monitor, modern breeding techniques, application of drone for animal security monitoring, modern animal products processing techniques, application of robots for animal management, etc. can be adopted seamlessly. On the contrary, application of many of these technological innovations could be practically impossible with the free range traditional livestock production and management system that is still prevalent in Nigeria today.

Figure 1 above is a picture of a typical cattle ranch showing a number of cows grazing on a dedicated grazing land with no crop farm seen within the vicinity. Here, possibility of a clash between crop farmers and the ranch operators is completely eliminated. The crop farmer and the livestock farmer are complementary to each other, thereby ensuring food security and economic prosperity. On the other hand, figure 2 below is the picture of a typical traditional pastoralist showing some cows grazing freely inside a farm land with yet to be harvested crops. In this case, instead of complementing each other to enhance food security, the pastoralist and the crop farmer are in constant conflict thereby putting food security in jeopardy. The result of this is low productivity and inefficiency for both the crop producer and the livestock farmer. In many instances the farmer – harder conflicts in Nigeria are deadly and it is the remote cause of many cases of insecurity in the country. The livestock sector in Nigeria is largely operated by the traditional pastoralists who are still stock to the old and obsolete free range nomadic method of livestock production which poses numerous challenges to modern society.

Continuous practice of the traditional livestock management system by majority of livestock holders in Nigeria would make application of technological innovations to manage the livestock of a large block of herders difficult and defeat achievement of food security by the country on the 2030 target year or even later. The sector is in dare need of changes which will allow injection of workable technological innovations for livestock development to enhance productivity, efficiency, promote food security and economic prosperity.

Thankfully, the Federal government is rising to the occasion through the newly established Federal Ministry of Livestock development. The programmes and activities of the ministry are geared towards transforming the sector to embrace technological innovations just like the other parts of the world where the gains have been enormous. Certainly, this is the way to go.

Figure 2: Typical traditional pastoralist in Nigeria

Satellite Navigation and Earth Observation Technologies to Maximize Agricultural Production for Sustainable Food Security.

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ABSTRACT

Agriculture represents around 15% of the continent's Gross Domestic Product (GDP) and employs two thirds of its population and thus, a critical market in African economy. With the downturn of the black gold (oil) market in 21st century and the rapid progress made in the green energy sector and most importantly, food insecurity across the nation, there is an urgent need to exploit the agricultural sector as a pillar of Nigeria's industrial/agro economy, with the aim of speeding up the development of modern and novel agricultural practices in Nigeria. This is expected to secure the economic health of Nigeria, which is expected, by the United Nations, to have the 3rd largest population in the world by 2045.

Satellite Navigation (SatNav) comprising of GNSS & SBAS and Earth Observation (EO) technologies presents a huge opportunity for precision agricultural practice beyond dominant subsistence farming not only in Nigeria but Africa to facilitate a new dawn of not just being a consumer but playing an important role of being producer of agricultural produce including agro-allied industries. GNSS is the generic term for Global Navigation Satellite System, for any of satellite constellations that broadcast positioning, navigation and timing data while Satellite Based Augmentation System (SBAS) improves the accuracy and reliability of GNSS positioning by correcting signal measurement errors and by providing integrity information allowing each user to get a highly reliable bound of its residual positioning error. Earth Observation (EO) satellites are satellites designed to monitor Earth's environment and resources from space utilizing various sensors and imagers to capture data about the planet's surface, atmosphere, oceans, weather forecast etc providing valuable information for diverse applications.

Precision agricultural practice with GNSS and/or SBAS via NIGCOMSAT-1R; Nigerian owned hybrid Communications Satellite with Navigation Overlay Service (NOS) and EO will improve and optimize crop yields and productivity, timely management of activities such as weed control, fertilizer application and harvest periods saving costs of inputs for both commercial and small scale farmers in Africa, high yield of dairy and meat production through livestock tracking, guidance and virtual fencing.

Other cost savings and environmental impact reduction that have been demonstrated are variable rate application, elimination of wastes and the over-application of fertilizers, herbicides and agrochemical among others geared towards efficiency and effectiveness to sufficiently end all

forms of hunger and malnutrition by 2030 in the continent in line with United Nations' Sustainable Development Goal 2 (SDG 2- Zero Poverty Agenda) to which African Governments are committed to.

Keywords: *EO, GNSS, Food Security, Livestock Management System, NIGCOMSAT-1R, Precision Agriculture, SBAS.*

INTRODUCTION

Climatic Conditions in most parts of Nigeria are warm and humid with the arable land area accounting for more than 33% of the land area but this is declining as a result of climate change. Before the rise of the oil boom, Nigeria was not only an agricultural country, but famous as a food warehouse in Africa. In 1960s, Nigeria's peanut exports ranked first in the world. The oil boom and rise of the oil industries in 1970s led to a significant decline in agriculture, thus Nigeria lost its strategically important food industry, which made a substantial contribution to export earnings. Agriculture, including farms, fisheries, livestocks, horticulture and forestry is a multi-billion industry anywhere in the world. Agriculture is a large and diverse sector that represents around 15% of the continent's Gross Domestic Product (GDP) and employs two thirds of its population, so it is a critical market in African economy With the downturn of the black gold (oil) market in 21st century and the rapid progress made in the green energy sector and most importantly, food insecurity across the nation, there is an urgent need to exploit the agricultural sector as a pillar of Nigeria's industrial/agro economy, with the aim of speeding up the development of modern and novel agricultural practices in Nigeria. This is expected to secure the economic health of Nigeria, which is expected, by the United Nations, to have the 3rd largest population in the world by 2045 (Lawal, 2022).

Nigeria's location in tropical and temperate semi-arid region with abundant rain and lush vegetation makes it a natural habitat for cattle breeding and rearing. In 2006, the stock of cattle reached 16.01 million. With substantial absence of investment and modernization in cattle breeding, the stock of cattle was 18.87 million in 2011. The annual growth rate of cattle breeding industry is at about 4%. At present, the cattle breeding industry is traditional, extensive with nomadic grazing, and cattle are often lost including farmlands destruction sometimes leading to clashes with farmers with resultant loss of lives and properties. In order to reduce the loss of the cattle raising industry in Nigeria, a unified platform is urgently needed to monitor location of cattle including confinement.

What was the last thing you ate? Where did it come from? How often do we reflect on the processes that create the food on our table? Each mouthful is a mix of produce from our farms, dairy industry and horticulture from our backyards or small scale farmers and livestock industries.

Section II describes Global

Figure 1: Satellite-Based Augmentation System Augmenting GPS, Galileo and GLONASS for Applications Aviation, Agriculture, Maritime, Survey, Rail, Defense and Road Transportation.(NigComSat Pilot, 2018).

Navigation Satellite System (GNSS) and Satellite-Based Augmentation System (SBAS) as made available of Nigerian Communications Satellite (NIGCOMSAT-1R) by means of Navigation Overlay Service (NOS), section III discusses needs assessment of GNSS/ SBAS in Traditional Agricultural Practice, section IV deals with the application of GNSS, SBAS and other technologies for Precision Agriculture and finally conclusion in section V ends the article.

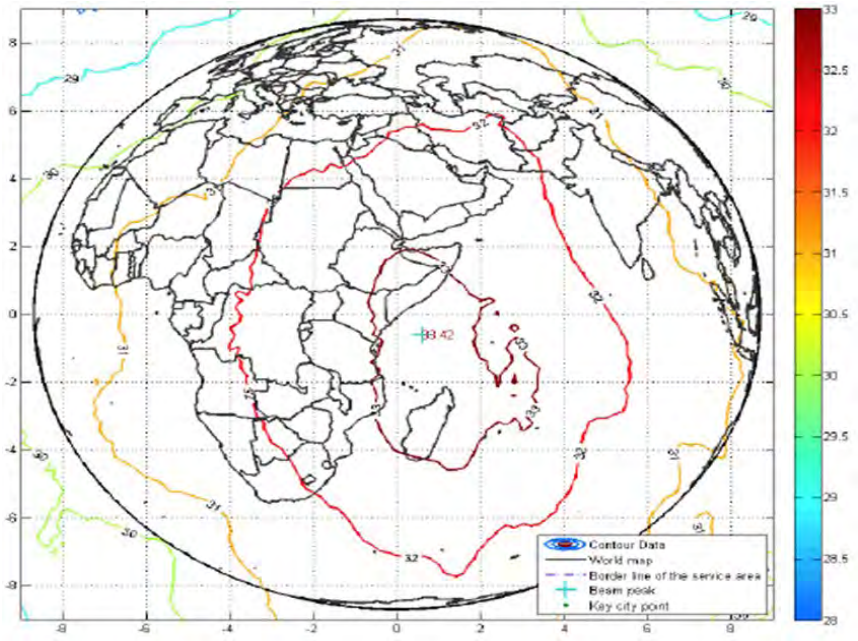

Figure 2: The downlink coverage beam of NIGCOMSAT-1R Geo-Navigation Satellite on L1 Frequency (Lawal & Chatwin, 2011).

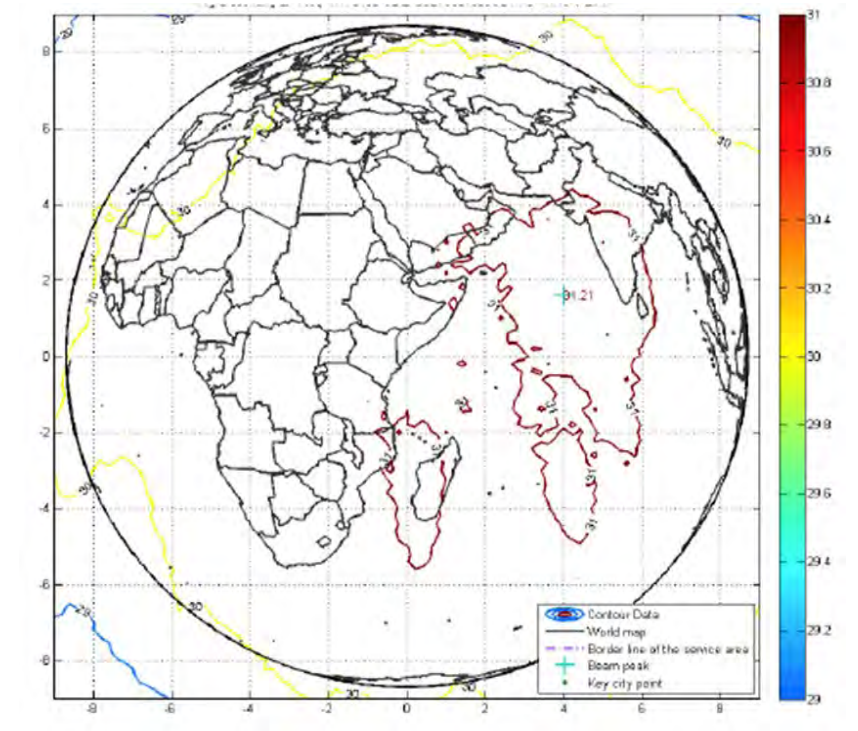

Figure 3: The downlink coverage beam of NIGCOMSAT-1R Geo-Navigation Satellite on L5 Frequency (Lawal & Chatwin, 2011).

WHAT IS GLOBAL NAVIGATION SATELLITE SYSTEM AND SATELLITE-BASED AUGMENTATION SYSTEM?

The Global Navigation Satellite System (GNSS) is the infrastructure that allows users with a compatible device to determine their position, velocity and time by processing signals from satellites. GNSS signals are provided by a variety of satellite positioning systems, including global constellations such as GPS owned and operated by United States of America; GLONASS owned and operated by Russia; Galileo owned and operated by European Union and BeiDou owned and operated by People's Republic of China.

As illustrated in figure 1, Satellite-Based Augmentation System (SBAS) arose from the need to provide Continuity, Availability, Integrity and Accuracy of GNSS signals to eliminate errors and compensate for discrepancies associated with GPS and other navigation systems signals. The operation of SBAS entails the measurement of the GNSS signals through located reference stations scattered across an area and/or regions or continent. The signal errors are then transferred to a data processing centre, which calculate the differential corrections and integrity messages are afterward broadcasted over desired area geostationary satellite with Navigation Overlay Service (NOS).The NIGCOMSAT-1R is a geostationary communications satellite with Navigation (L-Band) payload as Space-based Augmentation System meant to provide a Navigation Overlay Service (NOS) similar to the European Geostationary Navigation Overlay Service (EGNOS) with foot prints and coverage as provided in figure 2 and 3 respectively (Lawal, 2022). Satellites are making major improvements to agriculture not only through geolocation but remote sensing and increased connectivity for Internet of Things (IOT) among others.

Figure 4: Traditional versus Precision Agriculture (Lawal et al, 2021)

NEEDS ASSESSMENT OF SBAS IN TRADITIONAL AGRICULTURAL PRACTICE

The field traditional agricultural practice cannot be effectively divided for maximum yield per hectare. Spacing between plants cannot be controlled with chaotic management of agricultural machineries. Plant diseases cannot be found on time with difficulty in forecasting production. Infact, as depicted in figure 4, there is hardly basis for scientific and unified management of the farm and cannot guarantee food security and sufficiency for African growing population.

The xinjiang production and construction corporation introduced precision irrigation technology in 2011 in more than 120 acres of land as provided in figure 5. It maximizes water usage with increase in coefficient use from 0.40 to 0.53. Water consumption dropped from 1000 cubic meters to 620 cubic meters per acres of land, and saved water wastage by 40% ~ 50% while increasing cotton production and yield by about 20% per acre of land. Precision Agriculture generally increases yield per hectare with qualitative farm produce while lowering costs and minimizing environmental impact (Lawal, 2021).

APPLICATION OF GNSS/ SBAS & EO FOR PRECISION AGRICULTURE

Space-driven solutions in agriculture leverage satellite technologies, remote sensing, and other space-based tools to enhance agricultural productivity, sustainability, and resource management. These solutions are increasingly important in addressing global challenges such as food security, climate change, and resource scarcity.

GNSS/SBAS-based applications in precision farming are utilized for farm planning,

Figure 5: Precision irrigation technology for cotton production by Xinjiang Production and Construction Corporation. (Lawal et al, 2021)

field mapping, soil sampling, tractor guidance, crop scouting, variable rate applications, and yield mapping. Precision agriculture is a highly effective farming strategy that allows farmers to maximally allocate inputs (e.g. seeds and fertilizers) and increase productivity. The development and implementation of precision agriculture or site-specific farming has been made possible by combining arrays of technologies such as Satellite-based augmentation systems (SBAS), Earth Observation Satellites, Geographic Information Systems (GIS) among others. These technologies enable the coupling of real-time data collection with accurate position information, leading to the efficient manipulation and analysis of large amounts of geospatial data. This information can be communicated to farmers. SBAS-based applications in precision farming are being used for farm planning, field mapping, soil sampling, tractor guidance, crop scouting, variable rate applications, and yield mapping. Precision agriculture is a highly effective farming strategy that allows farmers to better allocate inputs (e.g. seeds and fertilizers) and increase productivity, while lowering costs and minimizing environmental impact. In precision agriculture with SBAS technology, it allows a pass-to-pass accuracy of around 20 cm; SBAS-enabled equipment can help farmers achieve a more homogeneous crop quality. It also allows farmers to adapt to spacing of a given crop according to soil clay content of a particular area and the end result is higher commercial return.

Using GNSS data and even more precisely Satellite Based Augmented Signals for field mapping help save farmers resources in tractor repairs by being able to record and map the location of rocks, potholes, power lines, broken drains, poorly drained regions and other obstructions. Using this technology, a farmer will also be able to record and understand geographic areas where there are pest infestations or high weeds, as well as map soil-sampling locations for contour maps showing fertility variations throughout the field.

attached to the farm machinery as provided in figure 6, thus assisting drivers to follow a pre-determined path, hence leading to precision agriculture.

Figure 6: Agricultural machinery with automatic navigation system (Lawal et al, 2021)

Some major GNSS/SBAS & EO applications in Agriculture include:

(i) EO for Environmental Monitoring and Site Selection: High-resolution satellite images help identify suitable locations for aquaculture farms by analyzing water quality, temperature, salinity, and depth. Oceanographic Imageries also provides data on ocean currents, chlorophyll levels, and nutrient availability, which are critical for selecting optimal sites for fish or shell fish farming. Remote sensing can be utilized for habitat mapping of coastal and marine habitats, such as mangroves and coral reefs, to ensure aquaculture development does not harm sensitive ecosystems.

(ii) Farm Machinery Guidance: Use of a digital display

(iii) Automatic Steering: The most advanced form of tractor guidance, used mainly on large farms, allowing farm vehicles to be automatically steered along a predetermined path as shown in figure 7. The operator can concentrate solely on monitoring the overall process.

(iv) Variable Rate Technologies (VRT) : Leverages local conditions on the field for precise control over farming inputs (e.g. fertilizers, nutrients). It identifies areas with similar levels of yield-limiting characteristics in a field and enables site-specific treatment. VRT technology with support of GNSS shows where fertilizer/ pesticides should be applied based on VRT application maps.

(v) Asset Management: Involves the use of real-time

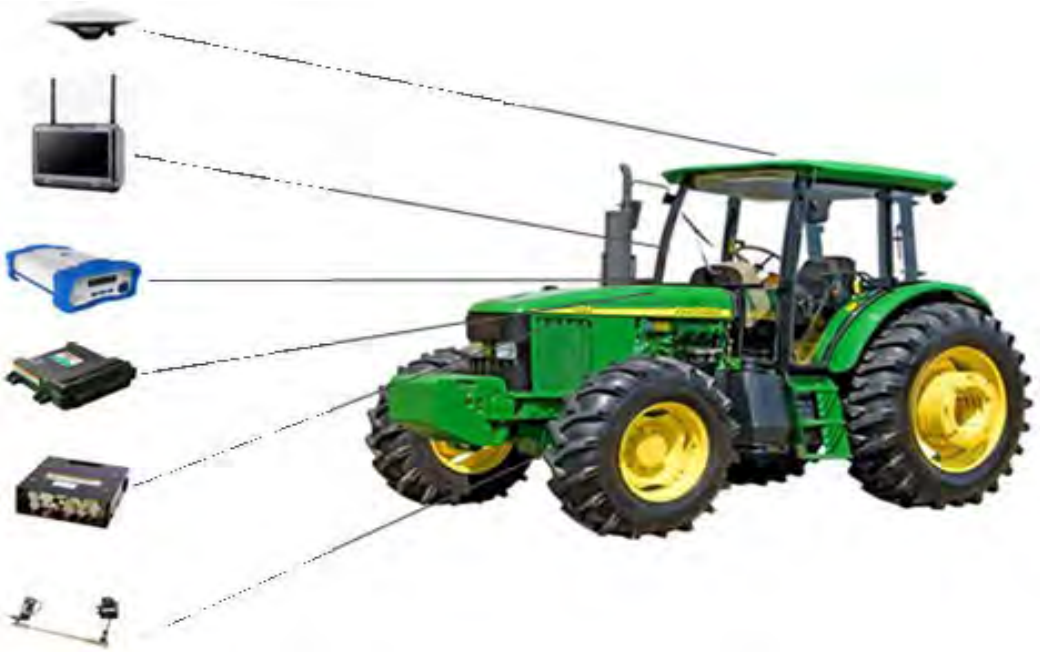

Figure 7: Farm Machinery Equipped with SBAS Solution for Precision Agriculture (Lawal et al, 2021).

information for monitoring the location and status of all farm equipment and assets.

(vi) Livestock Tracking, Monitoring with Geo-Fencing and Geo-traceability.

The livestock monitoring can greatly improve pasture lands efficiently and standardize the breeding of livestock by providing solution to get every cattle's location in real time. A positioning terminal is designed to transmit positioning data through 2G, 3G, 4G or 5G to cloud platform. The herdsman can view the precise position and situation of each animal in real time through mobile phone and prevent the loss of animals. Virtual Fencing (or geo-fencing) uses the GNSS based location of an animal in combination with a sound or electrical stimulus to confine animals inside (or outside) a predefined geographic area without fixed fences. The Geo-fencing application can aid in the prevention of clash between crop farmers/ herders and restricting livestock to an assigned corridor outside crop-lands as well as for the proposed national graze land corridor as mentioned in Lawal, 2021. The collars around animal's neck as shown in figure 8 are GNSS/SBAS receivers tracking and monitoring the cattle from centralized display while figure 9 is a mobile phone geo-fencing view of cattle. The Geo-traceability function of the dongle can be utilized to tell when the animal is diseased by analyzing the dizzying movement of the cattle. It also enables tracking of fish movements in open-water aquaculture systems, such as offshore cages or pens. Satellite positioning systemare valuable asset in supply chain management

. Figure 8: GNSS/SBAS receiver round the neck of cattles (Lawal et al, 2021).

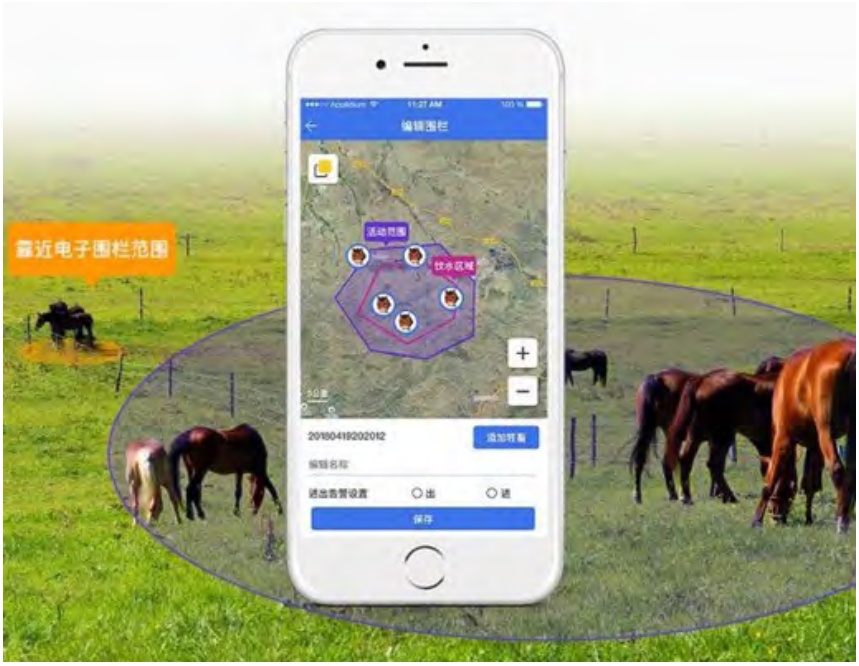

Figure 9: Livestock Management System with mobile phone geo-fencing view of cattle (Lawal et al, 2021)

and transparency by monitoring entire supply chain, from farm to market improving transportation efficiency for agricultural products. It includes enhancement of traceabilities etc.

(vii) GNSS/SBAS Application for Efficient Irrigation System.

GNSS technology can also help farmers manage water usage. The once-common practice of field flooding can be curtailed in Precision Farming. Field flooding is not only wasteful, but also destructive, as the overflow can drown crops and have significant pesticide and fertilizer runoff.

Better irrigation techniques e.g. utilizing sensors to record moisture levels in soil can help farmers to irrigate appropriately as shown in figure 10.

(viii) Water Quality Monitoring and Climate Change Adaptation with EO: EO Satellites equipped with sensors can monitor water quality parameters like temperature, dissolved oxygen, turbidity, and harmful algal blooms (HABs). Sea Surface Temperature Monitoring via EO helps farmers adapt to climate change impacts like heat stress on fish. They can serve as Early Warning Systems (EWS) to detect changes in water conditions that may indicate pollution or disease outbreaks, allowing farmers to take preventive measures immediately. Early warnings include extreme weather alerts such as storms, cyclones, or tsunamis allowing farmers to secure their infrastructure and protect stocks etc.

(ix) Disease and Pest Management with EO: Satellite data combined with machine learning (ML) can provide predictive modeling of disease outbreaks by analyzing environmental conditions that favor pathogens. Remote sensing can track changes in fish behavior or feeding patterns, which may indicate health issues. Satellites equipped with multispectral and hyper spectral sensors will monitor crop growth stages, detect stress (e.g., drought, pests, or diseases), and predict yields. Tools like NDVI (Normalized Difference Vegetation Index) helps in assessing plant health and biomass, helping farmers make informed decisions.

(x) Sustainable Practices and Certification: Satellites track land-use changes and carbon stocks, supporting climate-smart agriculture with Carbon Sequestration Monitoring. They can also be used to promote biodiversity conservation through monitoring habitats and ecosystems to ensure sustainable farming practices. In terms of environmental impact assessment (EIA), satellite data can assess

Figure 10: Automated Water Spray (Lawal, 2019).

the ecological footprint of for instance, aquaculture operations, supporting certifications like ASC (Aquaculture Stewardship Council) or BAP (Best Aquaculture Practices). These include monitoring illegal activities using remote sensing to detect unauthorized aquaculture activities that may harm ecosystems.

(xi) With GNSS/SBAS, EO and other technologies, a farmer will be able to:

i. Combining satellite data with IoT sensors and AI algorithms enables real-time monitoring and decision-making for aquaculture farms. i.e Space agencies like European Space Agency (ESA) supports projects like Aquaculture 4.0, which integrates satellite data for sustainable aquaculture. NASA provides satellite data for monitoring coastal and marine environments. Copernicus Programme offers Earth observation data for aquaculture applications. Also, NASA's SMAP (Soil Moisture Active Passive) helps in providing data on soil moisture levels, aiding irrigation planning and water conservation. Similarly, National Space Research and Development Agency (NASRDA) offers initiatives such CropWatch program which uses satellite remote sensing with AI to monitor crop growth and predict yields among others.

ii. Measure and gauge the soil moisture from a remote location using IoT as often as once per minute and redistribute water as needed without having to manually inspect meters in the field.

iii. GNSS antennas positioned on centre-pivot sprinkler systems that allow these automated systems to evenly distribute and cover massive crop circles without over-watering.

iv. Space-based remote sensing technologies are increasingly being used to quantify many components of the Earth system including vegetation types, land cover and land use, soil moisture, on-farm water storage and crop water use. There is significant scope to improve the management of agriculture and forestry by exploiting the available data from satellites. Next-generation sensor systems aboard miniature satellites provide alternative high-resolution data streams (spatial and temporal).

v. Visible light sensors are used to map crop distributions at a local and national scale. Infrared systems are used to monitoring biophysical parameters, such as vegetation moisture content and crop health.

(xii) GNSS Application with UAV for Agriculture Application

Combining GNSS/SBAS system with Unmanned Aerial Systems (UAS) and Remote Sensing helps provide farmers with (near) real-time sensing information for precision agriculture applications such as:

Figure 11: Automatic Harvesting (NigComSat Pilot, 2018)

i. Water stress monitoring

ii. Detection of nutrient deficiencies

iii. Crop diseases

The UAV can be coupled multi-spectral cameras for farmland data capture.

(viii) New Potentials in Agriculture: This include automatic harvest monitoring as shown in figure 11, Biomass monitoring, Soil condition monitoring, Yield monitoring, Environmental and Forestry Management, more efficient management of other farming activities such as pesticide spraying etc

(ix) Integrated Farm Management System GNSS & SBAS is a key component in an Integrated Farm Management System, which will support farmers in their decision making. Continuous observation from GNSS receivers provides an excellent tool for the studying of the earth atmosphere used for numerical weather forecasting, atmospheric research and space weather applications as mentioned

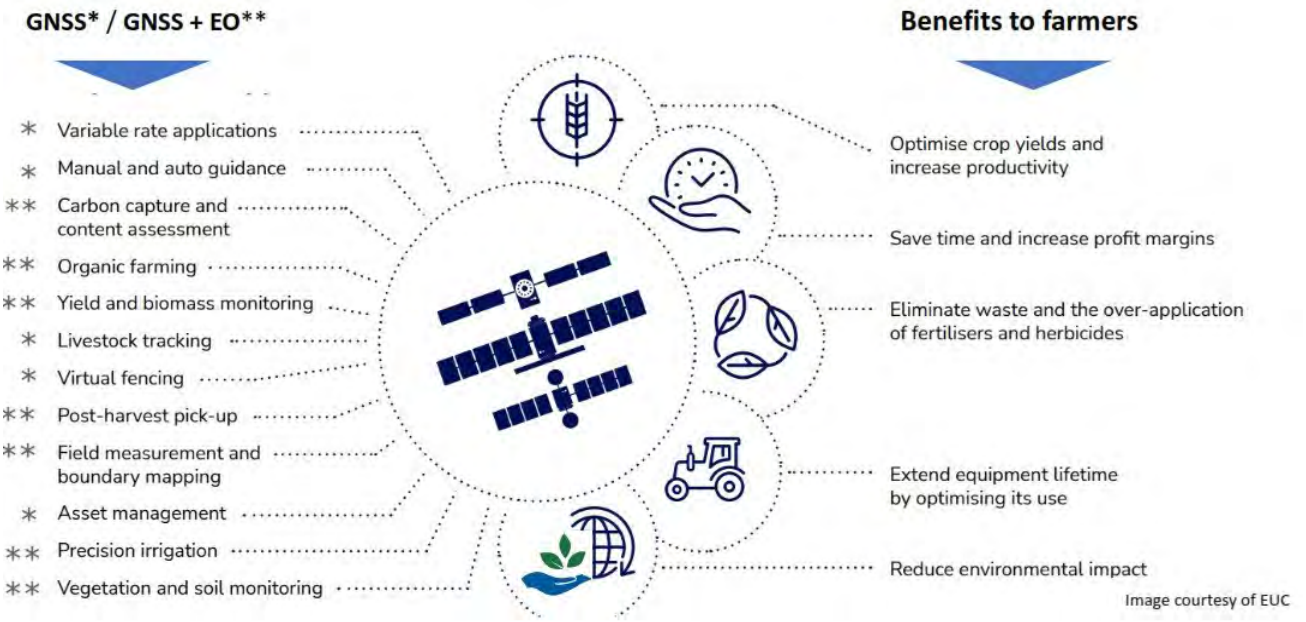

Figure 12: Benefits of precision agriculture to farmers with GNSS and Earth Observations as key enablers (JPO, 2024).

earlier. The components needed for Integrated Farm Management System are (i) Internet of Things (IoT) (ii) Robotics (iii) UAVs (iv) Earth Observation Systems and Meteorological data gathering (v) fusion with AI and ML algorithms.

The application of Space-based Technologies and tools in precision agriculture is a growing trend and there are several Research and Development going on in the field.

Farmers will also be able to record and understand geographic areas where there are pest infestations or high weeds, as well as map soil-sampling locations for contour maps showing fertility variations throughout the field. Figure 12 below shows overview of benefits of precision agriculture to farmers with GNSS/SBAS and Earth Observations as key enablers.

CHALLENGES TO PRECISION AGRICULTURE IMPLEMENTATION.

Some challenges that will impede the implementation of precision agriculture are:

a. Structural: Change culture from traditional practice to modernization. 90% of Sub-Saharan Africa's rural population depends on subsistence farming coupled with vulnerability of agriculture (i.e water supply-drought, climate change, floods etc.

b. Policy/Institutional: Land ownership as well as small scale farming with for instance 2 hectares of land constitutes impediment to large scale farming capacity.

c. Technical: Infrastructure gap, low level of mechanization, machinery costs, technical capacity and effectiveness of agricultural in provision of financial resource for precision agriculture development. Figure 13 shows challenges in Infrastructural Gap in terms of reference stations (GNSS CORS) from continental perspective (JPO, 2024).

d. Data Accessibility: Affordable and easy access to satellite data for farmers is a challenge worldwide.

e. Capacity Building: Training farmers and stakeholders to use space-based tools effectively as well as combining space data with artificial intelligence (AI) for advanced predictive analytics.

CONCLUSION

The source of food supply in developing countries is highly dependent on production by smallholder food producers with productivity remaining low. Global Total Factor Productivity (TFP) between 2006 and 2015 declined as food producers continue to convert forests and grasslands into farms to cope with increasing demand of food and feed. Land available for agriculture becomes scarce as cultivation through deforestation is no longer sustainable as a result of severe damage to the environment, causing soil erosion and reducing the quality of drinking water. Agriculture also accounts for about 71% of freshwater usage globally, and is one of the major contributor to water pollution from the use of pesticides and other contaminants. Global warming can threaten agriculture practices through rising sea level leading to reduction of land size and salinity intrusion, stress on water supply, fluctuations in peak temperature which could reduce crop yield, change to rainfall concentration which could cause droughts or floods, and increased frequency and severity of natural disasters. We must collectively revert these trends with precision agriculture as an efficient and resilient future food system has the potential to increase income of food producers with high quality, nutritious and affordable produce alongside livestock management system to

reduce farmers/herdsman clash and improve Nigerian livestock industry. NIGCOMSAT-1R SBAS as a Navigation Overlay Service (NOS) together with other technologies

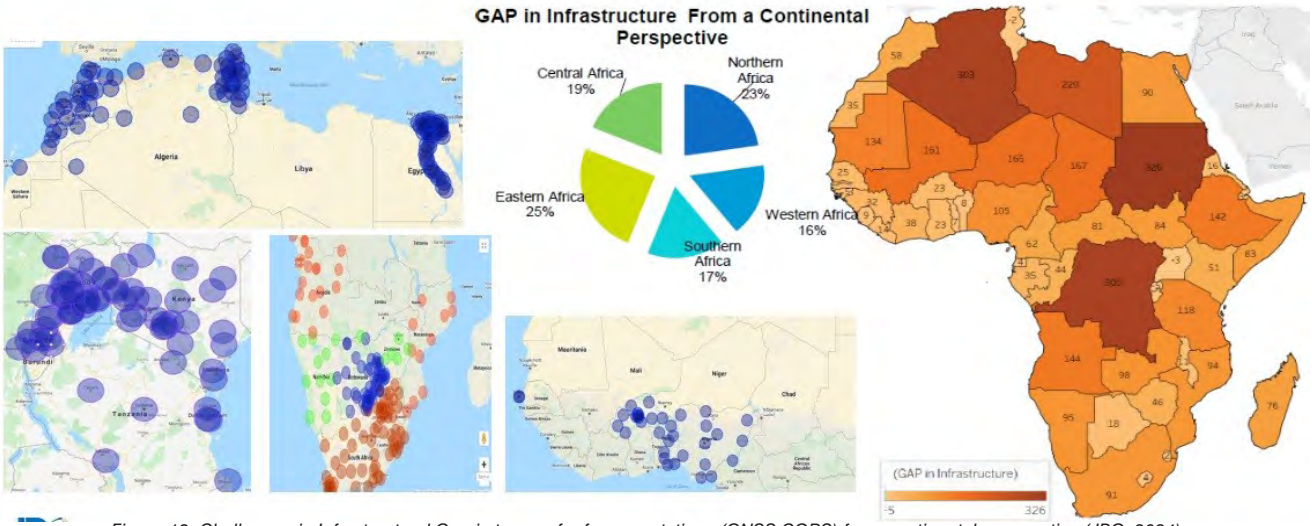

Figure 13: Challenges in Infrastructural Gap in terms of reference stations (GNSS CORS) from continental perspective (JPO, 2024).

presents a huge opportunity for precision agricultural practice beyond dominant subsistence farming not only in Nigeria but Africa. Key solution to fast track adoption at scale and technology validation at scale is demonstration with farm sites in practice to facilitate a new dawn of not just being a consumer but playing an important role of being producer of agricultural produce efficiently and sufficiently to end all forms of hunger and malnutrition by 2030 in the continent in line with United Nations Sustainable Development Goal 2 (SDG 2- Zero Poverty Agenda) to which African Governments are committed to. Such modernization will encourage youth to embrace agripreneurs with the new farming techniques, methodologies and business management to support food systems with resilience and security in Africa.

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Sustainable Livestock development for food security: Global perspective

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Livestock production is essential to global food systems, enhancing nutrition, rural development and economic stability. The Food and Agriculture Organization [1], states that livestock constitutes over 40% of global agricultural production and sustains the livelihoods of more than 1.3 billion people globally, especially in low- and middle-income countries. It serves as a significant source of high-quality protein, vital micronutrients and employment, particularly for smaller farmers. Nonetheless, the industry has significant sustainability difficulties. Livestock accounts for about 14.5% of worldwide anthropogenic greenhouse gas (GHG) emissions, mostly methane (CH_4) from enteric fermentation and nitrous oxide (N_2O) from manure management and fertilizer application. Furthermore, extensive livestock systems may lead to land degradation, loss of biodiversity, water pollution and antibiotic resistance [2]. Sustainable cattle development has emerged as a worldwide need. It pertains to livestock systems that are economically sustainable, ecologically prudent and socially accountable. This entails enhancing output via superior genetics, feed and animal health, while reducing emissions, maximizing resource use and safeguarding animal welfare. Attaining this equilibrium requires cohesive strategies that amalgamate scientific innovations, policy transformation and indigenous expertise[3].

Technological innovation is an important facilitator of sustainable livestock production. Recent advancements in digital agriculture, biotechnology and environmental engineering provide potential instruments to augment production, reduce environmental impacts and promote traceability and animal welfare. Technology is revolutionizing global livestock systems via precision livestock farming, mobile platforms, biogas digesters and AI-driven disease diagnoses.

This report analyzes the international perspective on sustainable livestock development, concentrating on five countries i.e. United States, Brazil, Netherlands, Kenya and India. These countries exemplify varied agro-ecological zones, developmental stages and livestock production systems. It examines the distinct problems faced by each country and emphasizing the integration of modern technology into sustainable livestock operations and the resultant results. The report provides insights and lessons via the comparison of various case studies, therefore informing worldwide initiatives aimed at developing more resilient and environmentally sustainable livestock systems.

United States

The United States dominates global cattle production, a highly advanced and technologically refined industry that enhances food security. Cash income from U.S. agriculture include more than 50% from animals, mostly beef, pig and dairy products. The country engages in extensive cattle production with advanced technologies and scientific research. This level of production presents sustainability concerns such as greenhouse gas emissions, water use, fertilizer runoff and animal welfare. The livestock sector contributes 4% of the country's greenhouse gas emissions, mostly methane from ruminant enteric fermentation and nitrous oxide

from manure management [4]. The Climate-Smart Commodities programme, which allocates over $3 billion to sustainable agriculture, is one of several USDA initiatives aimed at addressing environmental issues. Farmers are using rotational grazing, anaerobic digesters, and precision feeding to reduce emissions and enhance sustainability. Feed additives that lower methane, such as 3-NOP (3-nitrooxypropanol), may decrease enteric methane emissions by 30% without impacting animal productivity. Anaerobic digester manure-to-energy systems reduce methane emissions and generate renewable electricity for on-farm use or grid sale, enhancing their popularity.

RFID tagging and automated sorting gates oversee and manage livestock from farm to table. Livestock management solutions include data analytics and artificial intelligence. These technologies aid farmers in enhancing nutrition, reproduction, and healthcare via data use. Blockchain technology is being used to establish transparent supply chains, particularly for beef products, which consumers concerned with food safety, provenance, and ethical sourcing need.

Notwithstanding environmental limitations, the united states cattle industry has lowered greenhouse gas emissions per unit of output while simultaneously increasing

shown by the United States. Figure 1 shows an inclusive cattle feeder platform with real-time data and bookkeeping in the USA.

Brazil

Brazilian exports of cattle, poultry, and pork are among the highest globally. The cattle business is essential to Brazil's GDP, rural employment, and exports. Brazil is the largest exporter of beef globally and has a commercial cattle herd over 230 million head. The cattle industry faces criticism for its contribution to Amazon deforestation, greenhouse gas emissions, and land degradation. Brazil's primary challenge is in reconciling the demand and supply of animal protein with

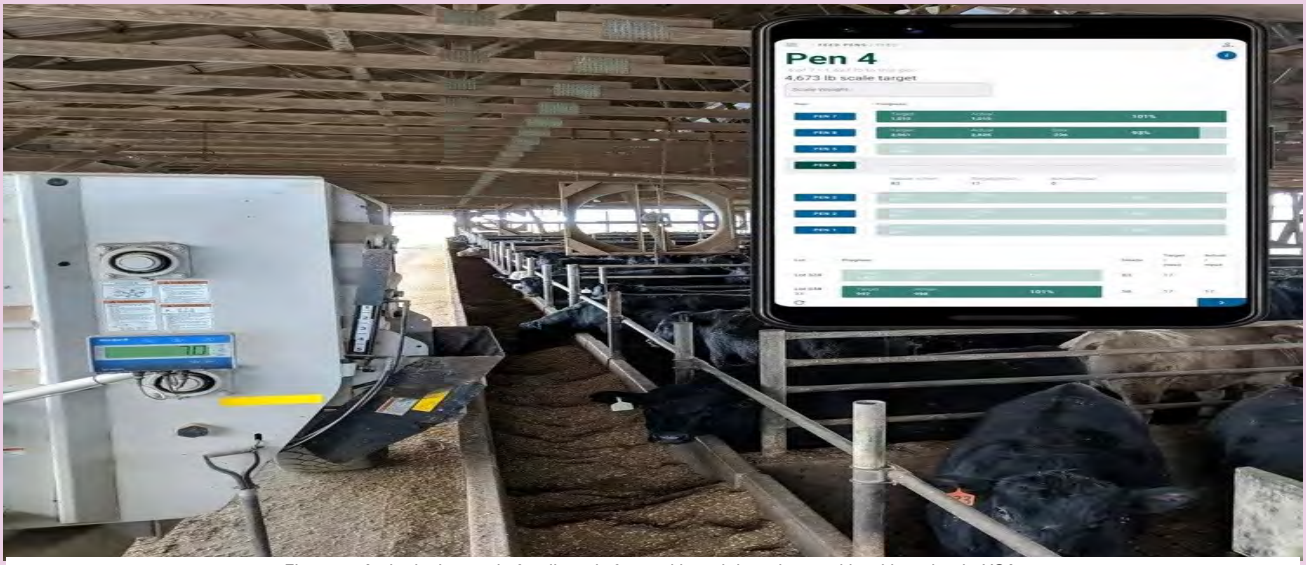

Figure 1: An inclusive cattle feeding platform with real-time data and bookkeeping in USA.

Technological innovations support the sustainability of U.S. livestock systems. Wearable sensors and IoT devices provide real-time monitoring of animal health, activity, and environment for precision livestock production. Cow Manager and Allflex empower farmers to evaluate reproductive condition, identify illnesses promptly, and enhance nutrition. This method minimizes antibiotic use and losses, enhancing animal welfare and output. Another transformative advancement is automation. Robotic milking systems, automated feeding apparatus, and waste removal devices are becoming used in the dairy industry, addressing labor shortages and improving efficiency.

productivity. Milk production per cow has risen since the 1980s due to advancements in genetics, nutrition, and animal husbandry, illustrating how innovation separates productivity from environmental consequences. Robust technology and substantial institutional support may sustain innovations in the livestock system, as seen in the United States. Extensive activities provide environmental hazards; nevertheless, climate-smart methodologies and digital agriculture are mitigating these risks. Scientific advancements, innovation, and robust regulatory frameworks may connect intensive livestock production with environmental stewardship and animal care, as

environmental sustainability. Cattle ranching leads to deforestation in the Amazon and Cerrado biomes, while enteric methane emissions from ruminants constitute a major agricultural greenhouse gas emitter in Brazil. The 2010 Low-Carbon Agriculture Plan and the 2020–2030 initiative in Brazil seek to enhance the sustainability of cattle production. This method promotes pasture restoration, integrated crop-livestock-forestry systems (ICLF), and manure management to mitigate climate impacts and enhance land productivity.

The broad use of integrated systems such as ICLF in Brazil, which cultivates crops, pastures,

Figure 2: Brazil Digital solutions for milk production

and trees concurrently on the same land, has sustainably revolutionized animal production. These methods enhance soil vitality, facilitate carbon sequestration, ensure animal welfare, and increase productivity. According to Embrapa, almost 17 million hectares in Brazil have adopted integrated systems, enhancing output and environmental advantages[5].

Remote sensing and satellite surveillance monitor land use, pasture conditions, and environmental regulations such as Brazil's Forest Code. MapBiomas and INPE satellite technology facilitate the identification of unlawful deforestation associated with cattle grazing and advocate for improved land-use policies. In Brazil, Precision livestock farming is expanding, especially among innovative farmers. GPS collars, wearable sensors, and mobile apps enable farmers to monitor animal health, activity levels, and heat stress. Enhanced breeding and feed optimization are concurrently lowering methane intensity per kilogram of cattle. Tropical Bovino, Embrapa's digital platform, provides farmers with data on pasture management, animal health, and environmental indicators to facilitate more sustainable decision-making.

In Brazil, Research organizations are investigating feed additives like tannins and essential oils to minimize enteric methane. Moreover, superior genetic selection and pasture management lower slaughter age, reducing lifetime methane emissions per cow. JBS, Marfrig, and Minerva Foods, major Brazilian meat firms, are under pressure to follow supply chain sustainability requirements. JBS's "Transparent Livestock Platform" uses block chain to track livestock origins and decrease deforestation risk. It aims to reach net-zero emissions by 2040. Despite progress made in Brazil's livestock development of Brazil, there are a number of challenges. Medium-scale farmers lack the funding, knowledge, and infrastructure to utilize innovative technology and sustainable practices, unlike major exporters. Duality in the cattle industry hinders sectoral reforms.

However, Brazil's efforts are yielding results. Over 100 million tons of CO_2 equivalent have been reduced via ABC Plan measures since 2010. Brazil has also boosted beef output while decreasing pasture acreage, improving productivity and land-use efficiency. Figure 2 shows innovative solutions for milk production in Brazil.

Netherlands

The Netherlands excels globally in agricultural and sustainable livestock production. Advanced agricultural techniques position it as a leading exporter of beef, dairy, and eggs. The Dutch cattle industry is working on reconciling economic productivity with environmental and social concerns, including nitrogen emissions, climate change, and land use. The country has pioneered innovative livestock systems in recent years.

In Netherlands, the substantial nitrogen production, mostly attributed to manure ammonia emissions, is a significant environmental concern. Nitrogen deposition resulting from animal production, especially in concentrated dairy, poultry, and swine industries, detrimentally affects natural ecosystems as well as air and water quality. The Dutch government has established manure limits, restrictions on animal populations, and a target for a 50% decrease in emissions by 2030 to mitigate nitrogen emissions [6]. Farmers opposed these limits while also advocating for innovation and structural transformation.

Technological advancement is essential for the survival of Dutch livestock. Precision livestock farming methodologies are often used to enhance output, reduce waste, and assist animals. Agriculturists evaluate livestock performance with automated milking robots, real-time health monitoring devices, and feed assessment systems. Dutch dairy farms integrate Lely's robotic milking systems with Nedap's animal management technology to achieve efficient, labor-saving, and welfare-oriented herd management. Dutch farms use anaerobic digesters and manure processing systems to mitigate manure emissions by generating biogas, organic fertilizers, and purified water. Pig and poultry house employs air scrubbers and low-emission flooring to mitigate ammonia emissions.

The Netherlands is advocating for alternate protein sources to reduce

cow use, in accordance with the EU's Farm to Fork initiative. Government-funded research institutions such as Wageningen University & Research (WUR) have been at the forefront of cultivated meat, insect agriculture, and plant-derived protein. Mosa Meat and Protix are renowned globally for their lab-grown beef and insect-based animal feed. These advancements resulted in sustainable protein production. The Dutch livestock system is also efficient. Dairy cows in the Netherlands produce around 8,000 liters of milk annually, ranking among the highest in Europe, while maintaining low carbon intensity. Effective management of high animal output allows for a reduced number of animals to meet demand, hence reducing environmental impacts. Supply chain traceability, quality assurance, and animal welfare certifications such as "Beter Leven" (Better Life) are firmly entrenched in the industry, ensuring consumer trust and transparency.

Notwithstanding these advancements, the Netherlands continues to grapple with agricultural economic viability and environmental regulations. Escalating costs, stringent regulations, and public scrutiny exert strain on small agricultural enterprises. The controversial government initiative to acquire several farms in protected regions to mitigate nitrogen pollution has generated significant dissent but demonstrates a courageous political impetus for reform. Agriculturalists may get financial and technical assistance from initiatives such as "Room for Transition" to implement sustainable practices

The Dutch model illustrates a systems-based approach that integrates policy, research, technology, and market incentives. Circular agriculture, digital farming, and robust institutional support are facilitating the sustainability of high-output livestock systems in the Netherlands. Figure 3 shows an automated animal feeding system in Netherlands

Figure 3: Automated animal feeding system in Netherlands

Kenya

The livestock industry in Kenya is vital to its economy and food system, especially for rural communities. Approximately 12% of Kenya's GDP is derived from livestock, which sustains over 60% of the rural population in arid and semi-arid lands, including more than 80% of the country [7]. Mixed crop-livestock systems are the predominant livestock production techniques for cattle, sheep, goats, camels, and poultry. The cattle sector in Kenya is impacted by climate change, land degradation, disease outbreaks, and resource competition, all of which threaten long-term sustainability and output.

In recent years, the growing frequency and severity of droughts suggest that climate change may be an important issue. These droughts restrict water availability, resulting in cow fatalities, food shortages, and communal conflict over resources. ASAL livestock production depends on natural rangelands, which are deteriorating due to overgrazing, inconsistent rainfall, and land fragmentation. The Kenya Climate Smart Agriculture Strategy (2017–2026), Livestock Master Plan, and Kenya Vision 2030 framework emphasize resilience, productivity, and market integration to tackle these challenges.

Technological innovations are facilitating the sustainable development of cattle in Kenya. Digital platforms for climatic data, veterinary services, and market accessibility represent significant advancements. Mobile apps such as iCow, DigiCow, and M-Farm assist farmers in monitoring the animal's health, obtaining veterinary assistance, maintaining production records, and engaging with consumer. Kenya utilizes digital reporting systems and community animal health specialists to enhance livestock disease surveillance and vaccination efforts. These advancements help in the prevention of transboundary diseases such as foot-and-mouth disease, peste des petits ruminants, and East Coast fever, which are prevalent in several places and hinder livestock productivity. Kenya employs climate-smart livestock practices such as rotational grazing, soil restoration, manure management and improved livestock breeds to reduce greenhouse gas emissions and bolster climate resilience.

Crossbreeding has yielded heat- and drought-resistant livestock, such as Sahiwal and Boran cattle, which are more efficient in turning grain into meat. These approaches adhere to Kenya's Nationally Determined Contributions under the Paris Agreement, aiming to diminish agriculture-related greenhouse gas emissions by up to 32% by 2030.

Kenya receives significant institutional backing from governmental bodies, research organizations, non-governmental organizations, and international development partners to enhance sustainable livestock practices. The Kenya Livestock Market Systems Activity, funded by USAID, enhances market accessibility, resilience, and value chain efficacy for livestock producers in ASAL regions. Kenya's traditional livestock systems are being enhanced by technological innovations that improve output and sustainability. Digital platforms, enhanced feeding systems, resilient breeds, and community-oriented disease control might address industry challenges. Figure 4 shows a new technology for cattle feed production in Kenya.

Figure 4: Cattle feed production in Kenya

India

India is a global leader in the production of milk, buffalo meat, and eggs, and has the highest population of livestock. Livestock contributes almost 4% to India's GDP, supporting over 300 million people [8]. Ownership of livestock safeguards the livelihoods and nourishment of marginalized groups, especially in climate-sensitive regions. India cultivates cattle, buffalo, goats, sheep, poultry, pigs, and camels using conventional, semi-intensive, and intensive techniques. The sector faces sustainability challenges such as greenhouse gas emissions, land and water us and disease control. More than 80% of livestock farmers in India own less than five animals. The industry's scale is hindered by low output, inadequate veterinarian care, and substandard feed quality. India is the leading producer of milk; nevertheless, the milk yield per cow is suboptimal.

Technological innovation is enhancing cow ranching in India, tackling productivity and environmental challenges. Innovation exists in the realm of animal health and disease management. Foot and Mouth Disease, brucellosis, and mastitis outbreaks in India diminish cattle production and increase antibiotic use. In India, the NADCP aims to vaccinate 500 million animals against brucellosis. Also, digital surveillance technologies like as NADRS and smartphone apps like e-Pashu Chikitsa enhance early epidemic detection, monitoring, and response. Genetic enhancement by artificial insemination and selective breeding is essential. The Rashtriya Gokul Mission of India advocates for the development of heat-tolerant, disease-resistant, and long-lived indigenous cattle breeds such as Gir, Sahiwal, and Red Sindhi. Genomic selection is increasingly used to improve breeding outcomes and remove unproductive male calves, so benefiting both animal welfare and the economics.

Feed deficiencies and inadequate nutrition are critical problems in arid regions. The Indian Council of Agricultural Research and commercial enterprises are developing AI-driven feed calculators to aid farmers in optimizing diets based on local resources and animal requirements. These advancements enhance feed efficiency, animal health, and methane mitigation. Examples include silvopasture,

Figure 5: Integrated livestock farming system in India

rotational grazing, manure management, and biogas from animal waste. India is investing in integrated livestock-fishery-cropping systems to diversify income streams and enhance nutrient cycling. The National Adaptation Fund for Climate Change is funding pilot initiatives in states like as Odisha and Maharashtra that promote climate-resilient livestock practices, including heat-resistant shelters, water harvesting, and stress-tolerant feed species.

Digital livestock technology has expanded in India via cooperation between government and commercial sectors, as well as agri-tech enterprises. Mobile applications such as Stellapps, MooFarm, and Animall provide digital dashboards for milk documentation, illness notifications, breeding services, and supply chain tracking. These platforms connect farmers with input suppliers, veterinarians, and milk collection facilities, enhancing transparency and market accessibility. Digitization has decreased milk adulteration, enhanced cold-chain processes, and augmented dairy farmer earnings. Notwithstanding these developments, there are still issues in the scalability of technology across India's extensive and diverse livestock systems. Infrastructure gaps, digital illiteracy, poor last-mile veterinary coverage, and fragmented markets hinder adoption, especially in remote locations.

In summary, India exemplifies both the opportunities and complexities of sustainable livestock development in a large, low- and middle-income country. The blend of traditional knowledge, government initiatives and digital innovation is transforming the sector toward higher productivity, As India continues to urbanize, integrating sustainability and animal welfare into livestock value chains will be key to long-term sectoral transformation. Figure 5 shows an integrated livestock farming system in India.

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Engineering a Culture of Prevention - The Nigerian Institution of Safety Engineers charts a new course in professional safety leadership

For decades, safety engineering in Nigeria existed only on the margins of public discourse—acknowledged, referenced, but rarely institutionalised. In factories, construction sites, health facilities, and on the country's highways, safety was more often an administrative function rather than an engineered solution. That is beginning to change.

The Nigerian Institution of Safety Engineers (NISafetyE), a division of the Nigerian Society of Engineers (NSE), is now helping to embed safety into the structure and culture of engineering practice across the country. Though relatively young among Nigeria's professional institutions, it has quickly become one of the most active, digitally fluent, and reform-minded arms of the NSE. Its approach—grounded in technical credibility, nationwide engagement, and cross-sector partnerships—is helping to move safety from rhetoric to routine.

A deliberate shift

In the last year, NISafetyE's membership more than doubled, growing from under 500 to over 1,000 registered engineers. The Institution's monthly expert lectures—free and open to all engineers—have trained over 200 professionals in areas ranging from process safety to construction hazard control. Its digital outreach has also expanded rapidly, with more than 2,000 active followers on LinkedIn alone, and even more on YouTube, WhatsApp, and other platforms. Yet the impact is more structural than social.

One of the Institution's early successes was the development of a Code of Practice for Health and Safety in Construction Projects—drafted by Nigerian engineers for use on Nigerian projects. The code was submitted to the Council for the Regulation of Engineering in Nigeria (COREN) and is under consideration as a national guide. Its aim is straightforward: reduce ambiguity, increase responsibility, and normalise design-led safety practices from project inception.

Practical advocacy

One of the most high-profile demonstrations of the Institution's evolving influence came in response to the series of fuel tanker explosions across Nigeria in 2023 and 2024. These recurring tragedies, with their devastating toll on human life and infrastructure, motivated NISafetyE's leadership to convene a National Workshop on Road Safety. The event brought together engineers, lawmakers, regulators, and transport operators to assess systemic gaps and propose enforceable interventions.

The Institution's partnership with the Edo State Ministry of Petroleum Resources, and its growing relationship with the National Assembly Committee on Safety Standards and Regulations, illustrate a quiet but steady integration into Nigeria's policy ecosystem.

Internal transformation

While NISafetyE's external visibility has grown, the Institution has also focused on internal reform. In 2024, it launched an automated membership portal, enabling streamlined onboarding, renewals, event registration, and communications. The overhaul of its website and digital resources has made participation more accessible—especially for younger engineers who prefer flexible, mobile-first platforms.

Equally notable is its contribution to HSE practice within the NSE itself. Working closely with the current NSE President, NISafetyE helped initiate reforms at the national secretariat in Abuja. These included the introduction of safety orientation videos for guests at the NSE headquarters as well as a safety induction video for the Annual General Meeting held in Abuja in 2024. The reforms also include a broader awareness on emergency preparedness at the NSE's Council meetings—cascading the impact to more than 80,000 engineers affiliated with the NSE in its 90 branches and 23 divisions.

Expanding credibility

NISafetyE's rising profile has attracted prominent members. Among them are **Prof. Bart Nnaji**, former Minister of Power; **Dr Vincent Ebuh**, a founding member of the Petroleum Technology Association of Nigeria (PETAN); and **Captain Chris Najomo**, a respected voice in aviation safety. Traditional leaders have also joined, including **His Royal Majesty, Edidem (Arc.) Obong (Barr.) Okon Asuquo Akpan**, the Paramount Ruler of Uyo, and the **Dan Galadiman of Kano**.

These affiliations are not merely symbolic. They reflect the Institution's success in positioning safety as a concern not only for technical professionals but also for policymakers, civic leaders, and investors.

A wider platform

In 2025, NISafetyE's National Chairman, Engr. Oluseun Faluyi, FNSE, was elected to serve as Chairman of all 23 NSE Divisions, a position that further consolidates the Institution's influence within Nigeria's engineering establishment. Under his leadership, NISafetyE has participated in high-level technical events, including the AfriSAFE Conference in Zambia, the Africa Process Safety Conference organised by DNV, and national commemorations of World Safety Day.

Looking ahead, the Institution plans to host an event to recognise TotalEnergies Nigeria, for the remarkable achievement of 16 consecutive years of LTI-free operations on the AKPO FPSO. This will be followed by its Annual General Meeting in Ibadan in October, which will centre on fire safety—a topic of growing urgency in urban Nigeria.

Conclusion

NISafetyE is still in its early years. But its dynamism, professionalism and consistency have allowed it to punch above its weight. Its combination of technical rigour, administrative reform, and policy engagement has positioned it to keep growing in meeting the expectations of safety engineers in Nigeria.

Interested in joining or learning more? Visit www.nisafetye.com or connect via LinkedIn.

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Enhancing the Future of Sustainable Livestock Through Technological Innovation

- Prof. Alonge

In a bid to address Nigeria's growing concerns around food security and sustainable livestock development, ***Professor Akindele Folarin Alonge, a distinguished Agricultural and Food Engineering expert and Dean of the Faculty of Engineering, University of Uyo****, offers deep insights into how technological innovation, ranging from renewable energy to precision livestock farming, can transform Nigeria's livestock sector. In this exclusive interview with Dr. Felicia Agubata FNSE, he discusses engineering solutions to longstanding challenges, the role of academia in shaping future-ready professionals, and the importance of collaboration among government, industry, and research institutions to scale sustainable technologies.*

As an expert in Agricultural and Food Engineering, how would you define the role of technology in ensuring sustainable livestock development in Nigeria?

Livestock refers to domesticated animals that are raised by man for various purposes like food, fiber and industrial uses. It is broad and each of them have their peculiarities. They include Cattle, Sheep, Goats, pigs, poultry, camels, donkeys and horses. They provide food (meat, milk, eggs), raw materials (wool, leather), services (transport, traction). Technology plays a vital role in addressing low productivity, environmental issues, disease outbreaks, inefficient use etc. These include development of machinery for harvesting, processing and packaging of animal feeds; provision of livestock structures for animal housing; improvement of breeding through use of artificial insemination and genetics; use of drones and sensors to monitor pasture health, water availability and animal movement

From your work in postharvest technology and solar drying, what innovative techniques can be adapted for improving livestock feed preservation and storage?

In Nigeria where climate change, infrastructure and resource constraints pose serious challenges, using solar dryers to dry forage, grains and other bye products can reduce spoilage from mold and pests. Hermetic storage can be employed in storing feed ingredients like grains in airtight containers to prevent moisture, insect and mold damage. Hermetic bags like PICS bags or silos for feed storage can be used.

What are the major engineering challenges you have observed in Nigeria's livestock value chain, and how can indigenous engineering solutions be applied to resolve them?

There are several engineering challenges that limits productivity and efficiency. These include inadequate infrastructure for production, processing, preservation and packaging. These infrastructure like poor housing and shelter leading to poor animal health and low productivity; little or no mechanization leading to increased labour, drudgery and low productivity. Others are;

Inadequate water supply and management. The water sources are unreliable and watering systems is inefficient leading to wastage.

Poor road networks and lack of special vehicles to transport the animals leading stress, injury and losses. Coupled with this inadequate cold chain leading to spoilage of perishable products like milk, meat and eggs.

Inadequate and unreliable power supply hinders feed processing, cold storage and mechanized operations.

Inadequate slaughter and processing equipment and facilities. Many abattoirs are outdated and lack modern equipment. Coupled with this is poor hygiene and sanitation.

How has your international experience with CIGR and ASABE influenced your perspective on sustainable agricultural systems for food security, especially in relation to livestock production in Nigeria?

I have been actively involved in these two global organizations for over two decades. The International Commission of Agricultural and Biosystems Engineering (CIGR) and the American Society of Agricultural and Biological Engineers (ASABE) are two leading global organizations that have significantly shaped perspectives and practices on sustainable agricultural systems, including livestock production, worldwide and in countries like Nigeria. I was privileged to be the President of the CIGR in time past and one of the major achievements during my tenure was the creation and establishment of Artificial Intelligence Data Science Working Group. This has added to the already existing groups and the effect is shaping the agric-food systems including livestock development globally. The influence of CIGR and ASABE is evident through research, standards, capacity building, and advocacy for sustainable and technologically advanced agricultural systems.

a. Promotion of Engineering Solutions for agricultural and food sustainability CIGR and ASABE emphasize the role of engineering and technology in addressing challenges in agriculture, such as resource efficiency, environmental protection, and productivity. Their guidelines and publications advocate for: Improved livestock housing and welfare; efficient feed production, preservation, and storage technologies; waste management systems (e.g., biogas, composting) and water and energy conservation in livestock operations. These principles are increasingly adopted in Nigeria through research collaborations, extension programmes, and policy recommendations.

b. Development and Dissemination of Standards. Both organizations develop international standards and best practices for sustainable livestock production, covering: animal housing design for health and productivity; manure management to reduce pollution; energy-efficient systems for feed processing and storage, etc. Many of our colleagues are members of these bodies. The standards are updated on yearly basis. Nigerian universities, research institutes, and policy makers often reference these standards when designing new facilities or revising regulations, promoting sustainability and food safety.

c. Capacity Building and Professional Development CIGR and ASABE organize conferences, workshops, and training programmes that bring together engineers, scientists, and practitioners from Nigeria and other countries. These events facilitate knowledge exchange on sustainable livestock technologies; encourage adoption of precision livestock farming, renewable energy, and digital agriculture and support the development of local expertise and innovation.

d. Research and Knowledge Sharing CIGR has produced compendium in all specialized areas of agricultural engineering (cigr.org). ASABE is hosting five international Scopus-indexed journal including conference proceedings and over 100,000 articles in their e-technical library (asabe.org). Through journals, technical reports, and proceedings, CIGR and ASABE disseminate cutting-edge research on climate-smart livestock systems, resource-efficient feed and water management, environmental impact assessment and mitigation. Nigerian researchers and students

benefit from access to this knowledge.

e. Local Impact in Nigeria Academic Influence: There are 34 universities in Nigeria where Agricultural Engineering is studied. Almost all these universities and indeed engineering faculties have incorporated CIGR/ASABE principles in their curricula and research. The new Core Curriculum Minimum Academic Standard (CCMAS) is a testament to this. Professional Networks: Nigerian engineers and scientists are active members of these organizations, bringing global best practices to local contexts. Collaborative Projects: Nigerian members of these bodies on corporate and individual basis have joint initiatives and partnerships with Nigerian institutions help pilot and scale sustainable livestock innovations.

Which renewable technologies can be harnessed to support livestock farming in off-grid rural areas of Nigeria?

These technologies include the ones below. These technologies can help provide reliable energy for water pumping, lighting, cooling, feed processing, and other essential farm operations. Here are the most suitable options:

a. Solar Energy: This is in abundance in Nigeria. This can find use for Solar PV (Photovoltaic) Systems and Solar water pumps. Solar PV systems can be applied for lighting, powering electric fences, water pumps for livestock watering, refrigeration for vaccines and milk, small feed mills. Solar Water Pumps can be used for pumping water from boreholes or wells for livestock drinking and cleaning. This reduces labor, ensures consistent water supply.

b. Biogas Technology - the use of Biogas digesters is applied for conversion of animal waste (manure) into biogas for cooking, heating, and electricity generation; the by-product (slurry) can be used as fertilizer. It reduces waste, provides clean energy, improves sanitation, and produces organic fertilizer.

c. Wind Energy. There is high potential of wind in the northern part and coastal areas of Nigeria. Small Wind Turbines can be applied as supplementary electricity generation for lighting, water pumping, and small machinery.

d. Micro/Small Hydro Power can be applied for electricity generation for farms located near streams or rivers with sufficient flow. The advantage is that they are reliable and consistent power if water source is available.

These renewable technologies can practically be applied in livestock farming in water supply for livestock drinking water; lighting for barns, security, and night-time operations; cooling and refrigeration for storing animal vaccines, milk, and other perishables. Other uses include feed processing, waste management and electric fencing. These solutions can improve productivity, reduce costs, and promote environmental sustainability.

With your background in engineering education and administration, how is the Faculty of Engineering at the University of Uyo preparing future engineers to address livestock-related food security challenges?

Our department of Agricultural and Food Engineering is collaborating with Faculty of Agriculture and specifically Departments of Animal Science, Food Science and Technology, Crop Science to address livestock-related food security challenges. Other steps being taken include the following:

a. Curriculum Development: Relevant courses in agricultural engineering, food engineering, a engineering, renewable energy, water resources engineering and management, and structural engineering are integrated into the curriculum. Interdisciplinary approach in terms of programmes often blend engineering with animal science, environmental science, and economics to provide a holistic understanding of food security issues.

b. Practical Training and Hands-on Experience which include Laboratory and Field Work are exposed to students. Students gain practical skills through laboratory experiments, farm visits, and internships with livestock farms or agro-industries. Students are also involved in Design Projects that focuses on solving real-world livestock challenges, such as designing efficient animal housing, automated feeding systems, or renewable-powered water supply systems.

c. Research and Innovation. There is a joint research, innovation and entrepreneurship project on Goat Value Chain between Department of Agricultural and Food Engineering and Department of Animal Science. Efforts are being made to extend this project to include Dairy Value Chain. Faculties encourage research in areas like animal waste management, biogas production, smart farming technologies (IoT, sensors), and disease control. Students are involved in research projects addressing livestock productivity, food safety, and sustainable farming practices.

d. Collaboration and Partnerships We are looking forward to Industry Linkages and partnerships with livestock farms, agribusinesses, and government agencies to expose students to current challenges and innovative solutions. We run workshops and seminars to keep both staff and students updated on emerging trends and technologies.

e. Community Engagement and Extension Services We are looking forward to Outreach programmes as we collaborate with Department of Agricultural Extension services to train local farmers on new technologies and best practices

for livestock management.

Given your involvement in several international engineering conferences and bodies, what global innovations in livestock development do you think Nigeria should localize, adopt and/or adapt?

Key livestock development innovations that Nigeria should consider adopting or adapting, tailored to local realities: a. Precision Livestock Farming (PLF) Technologies: Use of sensors, IoT devices, and data analytics to monitor animal health, behavior, and productivity in real time. This is necessary for Nigeria for early disease detection and improved animal welfare and optimized feeding and breeding. It can be adapted for cattle, poultry, and small ruminants. b. Renewable Energy Integration using solar, biogas, and wind energy to power farm operations (water pumps, lighting, cooling, feed processing). c. Automated and Smart Feeding Systems: This is use of automated feeders and rationing systems to optimize nutrition and reduce waste; This is recommended for Nigeria because it reduces labor and feed costs and can be scaled down for small and medium farms. d. Genetic Improvement and Artificial Insemination: This is use of AI, embryo transfer, and genomic selection to improve breeds for productivity and disease resistance. It increases milk and meat yields and educes susceptibility to local diseases.

e. Cold Chain and Value Addition Technologies: This include solar-powered cold rooms, milk chillers, and meat processing units to reduce post-harvest losses. f. Waste-to-Energy and Circular Economy Solutions: This is converting livestock waste to biogas and organic fertilizer. It provides clean energy for farm and household use and improves sanitation and soil fertility.

How can engineering societies like the NSE and NIAE effectively advocate for policy changes that will promote and facilitate technological adoption in livestock development?

They can employ a multi-pronged approach through the following actionable strategies: a. Conduct Research & Pilot Projects: Initiate and document pilot projects showcasing the benefits of modern technologies (e.g., automated feeding, climate-controlled housing, disease monitoring systems) in livestock production.

b. Collaborate with Government Agencies: Partner with ministries such as the Federal Ministry of Agriculture and Food Security to align advocacy efforts with national priorities.

c. Engage Livestock Farmers and Associations: Work with livestock farmers' groups to understand their challenges and co-create solutions, ensuring policies are practical and farmer-friendly.

d. Capacity Building and Awareness: through workshops and seminars and public awareness campaigns (use media (radio, TV, social media) to highlight success stories and demystify new technologies.

e. Policy Dialogue and Advisory Roles: this is through participation in policy forums and Technical Advisory Services. Technical expertise can be offered to lawmakers and government agencies during policy formulation and review.

f. Collaborate with Academia and Industry: this is through partnership with universities, research institutes, and agritech companies to foster innovation and ensure policy recommendations are grounded in current realities.

g. Leverage International Best Practices.

h. Advocacy Campaigns in direct lobbying of legislators and government officials to prioritize funding and support for livestock technology initiatives.

i. Monitoring and Evaluation through policy implementation and regular publishing of progress reports to maintain momentum and public interest.

Can you share successful case studies or projects you've supervised that demonstrate the impact of engineering innovations on livestock productivity and/or sustainability?

None However the plan is on for the goat value chain and dairy value chain.

As a consultant and educator, what partnerships or strategies would you recommend in bridging the gap between academia, industry, and farmers in scaling up sustainable livestock technologies?

Here are recommended partnerships and strategies, with practical examples and actionable steps:

a. Establish Multi-Stakeholder Innovation Platforms. The strategy is to create formal platforms or consortia that bring together universities, agribusinesses, technology providers, extension services, and farmer organizations. It works by regular meetings, workshops, and joint pilot projects; shared agenda-setting and problem-solving. Example is the Livestock Innovation Platform in East Africa, which connects research institutions, private sector, and farmer groups to co-develop and test new technologies.

b. Co-Design and Participatory Research: The strategy is to involve farmers and industry partners directly in research and technology development. It works through conduct on-farm trials and participatory technology assessments; collection of feedback from end-users to refine solutions.

c. Industry-Academia Joint Ventures and Incubators. The strategy is to foster joint ventures, research parks, or business incubators where students, researchers, and companies collaborate on commercialization. It works by universities hosting incubators for agri-tech startups; industry provides funding, mentorship, and market access. Example is Wageningen University's StartLife incubator, which supports livestock technology startups and connects them with farmers for field testing.

d. Student and Farmer Exchange Programmes. The strategy is to facilitate internships, apprenticeships and visits among students, researchers and farmers. It works through students intern with agribusinesses or on progressive farms; farmers visit research stations or participate in university-led workshops. Example: The Farmer Field School model, where researchers and farmers learn together in real-world settings.

e. Digital Platforms for Collaboration and Feedback. The strategy is to develop online platforms or mobile apps for knowledge sharing, technology dissemination and feedback collection. It works by:

- Academia shares research findings and training videos.
- Industry posts product updates and troubleshooting guides.
- Farmers provide real-time feedback and share local innovations.
- Example: Digital Green's video-based extension platform in India and Africa.

f. Policy Advocacy and Funding Consortia. The strategy is to work together to influence policy and pool resources for scaling up. It works by jointly advocacy for supportive policies (e.g., subsidies for sustainable tech) and application for grants as a consortium, increasing chances of funding. Example is the EU's Horizon 2020 projects, which require multi-actor consortia including academia, industry, and end-users.

Figure 1:Modern Dairy farming

Figure 2a and b: Milk Tank and modern cow milking

Figure 2s and b : Milk Tank and modern cow milking

Figure 5: Milk churning for butter production

Figure 4: Cheese coating for extension of shelf life

Figure 6: Crop production in green house

How Innovation, Policy and Youth Empowerment Can Be Championed for a Sustainable Nigerian Livestock Future

— Prof. Maikano Ari

In an era where climate change, food insecurity and youth unemployment intersect with urgent National priorities, a Policy Advisor and Deputy Vice Chancellor (Academic) of Nasarawa State University, Keffi, Prof. Maikano Mohammed Ari is redefining what sustainable livestock development means for Nigeria. In this exclusive interview with Dr. Lasisi Lawal FNSE, he outlines his bold vision, one where technology, tailored feed systems, policy reform, and youth-driven innovation come together to transform the livestock sector using digital tools to cassava-based feed, and from university-industry collaborations to the role of women and smallholders. Below are the excerpts.

How do you define "Sustainable livestock development" in the Nigeria context and what key indicators should we use to measure the success?

Sustainable livestock development in Nigeria, for me, is about building systems that deliver consistent productivity while protecting the environment and ensuring socio-economic equity. It's not just about increasing meat or milk yield, it's about doing so in a way that uplifts rural livelihoods, conserves our natural resources, and fosters resilience in the face of climate and market shocks. We should measure this by how well we've reduced our feed gaps, enhanced productivity per animal, promoted youth and women's participation, and improved returns across the value chain. These are the real indicators of success, not just output volume.

In your experience, what are the most impactful technological innovations currently shaping livestock productions in Nigeria?

Over the years, I've seen and worked with several impactful innovations, but a few stand out. Mobile-based feed formulation tools are revolutionising how smallholders optimise rations. Climate-resilient fodder varieties like improved Brachiaria and agro-by-products utilisation are helping us bridge seasonal feed deficits. Digital traceability and health tracking systems are transforming how we ensure quality and safety. I've also been involved in research on natural feed additives like Moringa and Roselle seeds, which are cost-effective and health-promoting. All these technologies, when localised and scaled, are game changers for the Nigerian livestock sector.

You've consulted on national livestock productivity projects. What policy reforms or frameworks are urgently needed to enable technology-driven food security in the livestock sector?

In my work with PTF, DFID, World Bank, AU-IBAR and ECOWAS, among others, one theme consistently emerges, the need for enabling policy environments. We need to fast-track the domestication and implementation of the best practices in National Livestock Transformation Plan, Presidential and Federal Ministry of Livestock Development initiatives, create state-level feed and fodder policies, and develop a Livestock Innovation Fund that supports startups and SMEs. Our regulatory institutions must also evolve to support innovation, from fast-tracking approvals to encouraging private-led research and investment. Technology alone is not enough; it must be backed by responsive policy.

Given Nigeria's diverse agro-ecological zones, how can feed and fodder innovations be tailored to regional needs to ensure sustainability and reduce seasonal shortages?

One size doesn't fit all when it comes to livestock feeding. What works in the Sahel may not work in the humid South. This is why the Nigeria feed and Fodder Multistakeholder Platform (NFFMSP) supported by AU-IBAR and FMLD is mapping fodder suitability by zone. In the North, we encourage dry-season storage and silage. In the Middle Belt, we're testing cassava and sugarcane-based feed from agro-waste, something I've personally researched. And in the South, protein-rich shrubs and tree legumes are the priority. It's about knowing your ecology, leveraging local resources, and adapting innovations accordingly.

What role can digital tools and data analytics (e.g., feed formulation apps, livestock traceability systems) play in boosting smallholder productivity and profitability?

Digital tools are democratising information and reducing the asymmetry that has long disadvantaged rural farmers. With simple apps, farmers can now balance rations, track animal health, and access pricing information in real time. For us at NFFMSP, data analytics also means better decision-making, we now use dashboards to plan interventions, assess feed gaps, and coordinate with government and private actors. Technology gives us agility, accuracy, and access , the three things that define modern livestock systems.

As President of the Nigeria Feed and Fodder Multi-stakeholders Platform, what specific strategies are being implemented to bridge feed quality and quantity gaps?

At NFFMSP, our focus is on building structured markets and creating business-to-business (B2B) linkages. We've organized deal rooms in Lagos and Abuja to connect feed producers with dairy cooperatives and aggregators. We're promoting regional fodder hubs to serve as storage and processing centres. We're also developing digital traceability tools and advocating for standardization with NIAS, NAFDAC and SON. Bridging the gap is not just about producing more , it's about aligning quality, quantity, and market access.

What are the most promising local feed resources you've researched, and how can we scale and promote their adoption and adaptation among rural farmers?

Through my academic and field work, I've seen the immense value in resources like fermented African locust beans, processed soybeans, sugarcane scrapings, and Moringa. These are locally available, nutritionally potent, and culturally acceptable. But we can't scale them without robust demonstration sites, strong extension systems, technology infusion and partnerships between research and industry.

Our universities, polytechnics, and cooperative unions must be empowered to become vehicles for widespread adoption. It's not just about innovation. it's about institutionalising innovation.

How can universities and research institutions collaborate effectively with industries to commercialize livestock innovations and enhance agripreneurship?

I often say: research must leave the shelf and enter the shed. This means forging symbiotic relationships between academia and the private sector. At Nasarawa State University, for instance, we're creating platforms through the various arms and platforms to engage industries in research design, implementation, and commercialisation. We need more internship pipelines, industry-based labs, and co-funded innovation hubs. It's time universities became not just knowledge centres, but engines of economic transformation.

Looking ahead, what are the top three risks to achieving food security through livestock in Nigeria, and how can technology help in mitigating the identified risks?

Three major risks confront us: Feed insecurity, climate unpredictability, and insecurity. These are systemic challenges, and technology provides partial answers. Irrigation systems and drought-tolerant forages can cushion seasonal deficits. Digital traceability can help de-risk markets. Fencing technology and geolocation can enhance livestock security. But beyond tools, we need political will, policy coherence, and community trust to implement these solutions. Technology works best when people and systems are ready for it.

What advice would you give to emerging livestock scientists and engineers aiming to drive innovation and sustainability in Nigeria's agriculture sector?

To the young minds coming into this space, I say this: localize your innovation, stay grounded in context, and let impact guide your ambition. Learn to speak both science and policy, because change happens where those worlds meet. Work in teams. Embrace digital tools. Never be afraid to pilot, to fail, and to iterate. This sector is crying out for smart, ethical, and committed innovators. Be the bridge between knowledge and transformation.

THE NIGERIA NATIONAL DAIRY POLICY

TOWARDS LIVESTOCK DEVELOPMENT AND SUSTAINABLE FOOD SECURITY

EXECUTIVE SUMMARY

This National Dairy Policy framework is imperative to guide public and private sector interventions and investments in the Nigerian dairy industry for the attainment of self-sufficiency in milk production and global competitiveness. It also seeks to provide framework and guiding principles for the development of an efficient and sustainable dairy industry to satisfy national demand for milk and milk products.

Several factors militating against dairy development in Nigeria includes poor animal husbandry practices, inadequate and low quality feed, trans boundary disease prevalence, inefficient animal disease management, effects of climate change, infrastructure deficit especially cold chain and milk collection facilities, diminishing grazing areas and limited access to water and pasture especially during dry season. Further to addressing these issues, this policy will promote synergy among actors in the industry.

Since independence, the Federal Government of Nigeria has launched several programs in an attempt to scale up local production of milk in the country. The first National Development Plan (1962 -1968) was focused on curtailing tsetse fly and improving beef production. The second National Development Plan (1970-1974) was implemented to facilitate and encourage milk production from selected indigenous breeds of cattle under favorable conditions. However, both plans did not achieve the anticipated results. Several attempts were earlier made to improve the genetic composition of the indigenous dairy producing cattle. Among the attempts include the introduction of Montbelliarde cattle from Cameroon by the then Western Region Government in the 1950s to improve milk production. Leveraging on the success of the National Veterinary Research Institute (NVRI), Vom, Plateau State, there were increased crossbreeding programmes in many parts of the country around 1955 to 1956. These were the interventions that yielded excellent results as the crossbred calves produced 100% above their white Fulani dams.

The previous government plans and programmes on dairy development focused on promoting milk production with limited emphasis on processing, marketing and consumption which contributed to its limited success. Attaining a dynamic, efficient, effective and globally competitive and sustainable dairy industry will require the development across the dairy value chain and other milk producing animals such as goat, sheep and camel.

Several cutting edge strategies have been identified in this policy to foster the development of the dairy industry in Nigeria, these include:

- Encourage intensive animal husbandry to replace the traditional free range systems practiced by small holding cattle famers. This would enable large scale application of technological innovations in dairy production and processing for greater productivity and efficiency.
- Intensifying the identification and selection of local breeds for crossbreeding using recommended Breeds in the National Animal Breeding Policy to increase milk output per cow.
- Strengthening productivity-enhancing services – animal health and genetic improvement services.
- Strengthening extension delivery mechanisms and organization of field days/demonstration events.
- Providing feed and feed supplements through input support mechanism.
- Prioritizing capacity building on dairy production and management, as regards

forage conservation, animal husbandry practice, milk collection processes, hygienic milking techniques and milk production business.

- Establishing milk collection centers (MCCs) close to mini dairy/commercial processing factories for milk aggregation, quality control, input supply, extension and veterinary services.
- Facilitating a guaranteed farm gate price for raw milk by enhancing milk collection and marketing and assuring payment by commercial processors.
- Partnering private investors in the provision of milk bulking and transportation equipment to processing factories.
- Applying a progressive minimum percentage of locally sourced milk as local content of all milk products of reconstituted /recombination factories to substitute importation.

Strategies were also developed to strengthen the dairy production which include dairy animal health management, genetics and breeding, fodder production and feeding extension and advisory services, research and development.

This policy document also highlights the institutional framework and cross- cutting issues in relation to the national dairy coordinating body, formation and strengthening of dairy cooperatives, dairy sector financing, gender sensitive and youth involvement, land and water as essential resources, and human resource development.

In addition, the policy detailed the dairy marketing and trade, dairy business environment and value addition strategies that are requisite to attaining a developed and sustainable dairy sector.
In conclusion, stakeholders are expected to be committed to the dairy transformation to strengthen milk collection and marketing, enhance productivity services including animal health, genetic improvement and capacity building of dairy farmers. This policy has been approved by the Federal Executive Council (FEC) for public use.

Abridged from the approved National Dairy Policy (2023 – 2028

Mr. George Olutope Onafowokan, FNSE

Mr. George Olutope Onafowokan is a distinguished professional and accomplished entrepreneur. He holds a combined bachelor's degree in accounting and finance from Manchester Metropolitan University, UK, and a Post Graduate Diploma in Management and Information Systems from the University of Salford, UK.

He is a member of Professional bodies such as Manufacturers Association of Nigeria (MAN) and The Lagos Chamber of Commerce & Industry (LCCI). He was recently conferred honorary fellow of the Nigerian Society of Engineers (FNSE), for his outstanding contributions to the Engineering Society at large. He also holds the esteemed position of Chairman at the Manufacturers Association of Nigeria (MAN), Ogun State Chapter.

A distinguished professional and accomplished entrepreneur, Mr. George Onafowokan currently serves as the Managing Director/CEO of Coleman Technical Industries Limited, a renowned manufacturer of Coleman Wires & Cables. In 2002, he joined Coleman Technical Industries Limited, to spearhead the comprehensive restructuring of the Company, with its assets growing from N50 million in 2002 to over N400 billion by the end of 2024.

Mr. George Onafowokan has made transformative contributions to the cable manufacturing industry and Energy sector. His research and innovative designs have significantly enhanced the development of high performance cable technologies, with a particular focus on fire-resistant cables. Coleman's cables offer superior conductivity, durability, and fire safety through advanced materials and insulation techniques.

Under his leadership, Coleman has achieved significant milestones, including:

- Commissioned the first voltage XLPE cable plant in West Africa; Commenced a 25,000-ton factory to manufacture 36KV low-high voltage Marine, Transmission, ACCC, GAP and power cables.
- Commissioned the first FIBRE OPTIC cable plant in West Africa; Pioneering products like Coaxial TV/Video cables and Cat 5/Cat 6 cables, setting new standards in Nigeria and West Africa.
- Commissioned the largest cable manufacturing factory in West Africa at Arepo, Ogun State with installed capacity to process about 390,000 metric tons of copper and about 100,000 metric tons of aluminum per annum.

Mr. George Onafowokan is a motivational speaker, business analyst and a seasoned entrepreneur who is passionate about the Nigerian dream. He is happily married with children.

TOP ENGINEERING PROFESSIONALS: WHO IS WHERE!!

Engr. LASISI SALAMI LAWAL (PhD, FNSE, SMIEEE, SMAIAA, MIET,MNIM).

Engr. Dr Lasisi Salami Lawal was born on the 31st of October, 1975 in Jos, Plateau State, to late Alhaji Abdulsalami Balogun Lawal and Bilikisu Lawal, Ogaminana, Kogi Central District of Kogi State.

He finished his secondary education at Abdul Azeez Atta Memorial College, Okene (AAAMCO), after being asked by the then, Ministry of Education, Kwara State to leave Government Secondary School, Ogaminana where he had an outstanding performance in Junior Secondary School Examination in 1990 to AAAMCO as one of the recognized Science Secondary Schools in the then, Kwara State now Kogi State where he bagged 7 distinctions and 2 credits in 1993 WASCE. He gained admission to Federal University of Technology, Minna in 1994 and received his first degree in Electrical and Computer Engineering in 2000 with Second Class upper division (4.15/5.00). He had his National Youth Service in Abuja and received Federal Capital Territory National Youth Service Corps Award for Outstanding Community Services in July, 2001. He enrolled for Business Management Technology in 2004 and received Post Graduate Diploma (PGD) from same Federal University of Technology, Minna-Niger State, Nigeria. He completed a two-year technology transfer training program at the China Academy of Space Technology in Beijing gaining a Satellite Professional Certificate in Communication Satellite and Space Technologies and emerged as one of the best among the trainees in 2007.

In his quest for further knowledge, he proceeded to United Kingdom and gained an MSc (Distinction) in Satellite Communications and Space Systems from the University of Sussex in 2011 and a PhD in Engineering from the same University in 2014. Dr Lasisi is a Master's Degree holder in Electronic (Communication) Engineering from the University of Nigeria, Nsukka, Enugu in 2017 and has completed an MBA programme with the same University with thesis titled "Impact of advanced satellite (HTS) on profit performance" and a fellow of Leadership and Development Course (Set 23) at African Centre Leadership, Strategy & Development School, Abuja from 2024 to 2025.

Dr Lawal is a Registered Engineer in Nigeria and a member of several professional bodies nationally and internationally, including Fellow of the Nigerian Society of Engineers, Fellow of Nigerian Institute of Electrical and Electronic Engineers, Fellow, Nigerian Institution of Space Engineers, Senior and Live Member of American Institute of Aeronautics and Astronautics, Fellow of African Scientific Institute, Senior Member of Institute of Electrical and Electronic Engineers to mention a few.

He is currently Associate Professor, Usmanu Danfodiyo University, Sokoto, an Expert in the Satellite Industry & Deputy General Manager with Nigerian Communications Satellite Ltd, and Vice-Chair, International Telecommunication Union Radiocommunication (ITU-R) Satellite Study Group 4 (2023-2027) leveraging his over 24 years industry experience, leadership skills and knowledge.

He is Academic Advisory Board Member of The International Education Management Agency (IEMA), United Kingdom, International Advisory Board member of International Conference on Computer, Communication and Control Technology (I4CT); Editorial Board Member of American Journal of Engineering and Technology Management (AJETM); Editorial Board Member of Nigerian Society of Engineers (NSE) and Board Member, Engineering Regulation Monitoring and Enforcement & Chair, Aerospace & Aviation Sector with the Council for the Regulation of Engineering in Nigeria (COREN).

He was Vice Convener, International Telecommunication Union (ITU) Resolution 609 Consultation Meeting, Geneva, Switzerland from 2016 to 2019; Member of ICT Systems Thematic Group, The Science and Technology Policy Commission (STPC) of Nigerian Economic Summit Group (NESG) from 2017 for 5 years; National Member of ICT Technical Working Group of National Integrated Infrastructural Master Plan (NIIMP) for 30 years (2014-2043) at the instance of National Planning Commission in 2013, Research Expert (Contract Expert No.CT-EX2015D258412-101) to Research Executive Agency of European Commission from 2020, A volunteer of Institution of Engineering Technology (IET) and IET Achievement Medal Panel Member and Judge since 2023; ACTINSPACE mentor; International Hackathon in space application co-organized by the Centre National d'Études Spatiales (CNES); the French National space Agency and European Space Agency (ESA) and a mentor for Africa Prize for Engineering Innovation launched in 2014 by the Royal Academy of Engineering. The Africa Prize for Engineering Innovation awards is a crucial commercialization support to ambitious African innovators developing scalable engineering solutions to local challenges, demonstrating the importance of engineering as an enabler of improved quality of life and economic development.

He received $42,000.00 Research Grant Award in December, 2021 as the Principal Investigator (PI) for a project titled Tele-medicine as a Panacea to Medical Tourism in Africa exploiting Communication Satellite Technologies as one of the winning proposals in the international research competition organized by the International Telecommunication Unions (ITU) Connect2Recover initiative; the first ever international research competition organized by the ITU. The competition which received 307 entries from 80 countries across five continents had 15 outstanding winners which include his research project.

He brings his professional and multidisciplinary knowledge to bear in fostering a nexus between academia and industry to strengthen emerging concerns and innovative technologies covering Space Systems Engineering, Space Science & Technologies, Climate Change Issues and Actions, Satellite Applications & Solutions, Satellite Navigation Technologies (GNSS & SBAS), Satellite Project Management, Space Sustainability, Renewable Energy, Sustainable Environment, NewSpace 2.0 utilizing Artificial Intelligence (AI) including Fusion of AI tools for UAVs and Autonomous Systems interfaced with GNSS and/or SBAS for Precision Agriculture and other applications as well as Ethical Considerations in the use of AI for Health Systems, Industrial Automation, and Robotic Applications. These includes health impacts of climate change and the near-term benefits of mitigating greenhouse gases (GHG) especially as it concerns Sub-Saharan Africa and collective adaptation strategies to increase community or organizational resilience to the health consequences of climate change and improve health equity and insights on how to communicate them effectively to stakeholders.

He develops solutions to engineering problems using new or existing technologies through innovations, creativity and change management; including technical accountability for complex systems with significant levels of risk as evident in some of the engineering projects he has handled including having hands-on experience on two communications satellites launched for Nigeria (NIGCOMSAT-1 and NIGCOMSAT-1R) as a project team member and leader meant to connect the unconnected in unserved and underserved communities of Africa and promote digital transformation and knowledge economy.

He is 2023 Institution of Engineering and Technology (IET) Global Impact Award in healthy lives, assisted living & robotics category received on 28th March, 2023 at IET Headquarters, Savoy Place, London. The research leveraged multi-displinary fields covering Digital Engineering, Communications Satellite System, Software Application, Cybersecurity, Telemedicine, Informatics and Renewable Energy to fast-track United Nations Sustainable Development Goals.

He has 69 Publications covering Book Chapter Contributions, Journals, Conference Proceedings, National & International Presentations in Space-Related Conferences and a patent (https://scholarprofiles.com/0000-1062-2327)

He navigates volatilities, uncertainties, complexities, and ambiguities (VUCA) from multidisciplinary perspective being a "spider in the web" as an academic and industry practitioner to drive evidence-based research and practice. He is naturally motivated to collaborate, connect, engage, solve, shape, sustain, foster and strengthen emerging engineering issues of concerns contributing to body of knowledge and United Nations Sustainable Development Goals (SDGs).

Engr. Prof. O.A.U. Uche, FNSE, FNICE
Registrar of COREN

Engr. Prof. O.A.U. Uche, FNSE, is currently the Registrar/CEO of the Council for the Regulation of Engineering in Nigeria (COREN) from March 2025. He is a Professor of Civil/Structural Engineering in the Department of Civil Engineering, Bayero University, Kano.

Engr. Prof. O.A.U Uche, FNSE was born August 1st 1965 at Amuda – Isuochi in Umunneochi Local Government Area of Abia State to the Family of Elder Anyabuoke Jude Uchegbusi.

He attended Development Primary School, Owerri, 1972- 1978 for his Primary Education, Isuochi Secondary School and the prestigious Emmanuel College, Owerri, 1978-1983 for his Secondary Education. From 1983-1988, he attended the College of Technology Owerri (Federal Polytechnic Nekede, Owerri) where he graduated with HND Distinction in Agric. Engineering and was a joint Valedictorian in the Polytechnic's 1989 convocation, having graduated as the best Student.

After his NYSC in then Plateau State's College of Agriculture, Lafia 1989, the young Uche joined the services of Champion Newspapers Ltd, Lagos. His chanced posting to Kano State in 1991 saw him enrolling into Bayero University Kano, where he graduated in Civil Engineering with upper second-class degree in 1994. He won the best graduating student honours among other awards in that year.

His desire for excellence saw him obtain a Master of Science (MSc) degree in Civil Engineering from the famous Ahmadu Bello University, Zaria by the year 2000. By 2001, Prof. Uche joined the services of Bayero University, Kano, by divine arrangement as an Assistant lecturer.

His zeal and steadfastness, coupled with a workaholic attitude and divine grace, saw him obtain a Doctor of Philosophy degree (PhD) in Civil Engineering in December 2008, also from Ahmadu Bello University, Zaria. Prof Uche's contributions to the Engineering profession have remained largely in Engineering Education and Administration which involves the training of manpower for the construction industry by teaching, researching and supervision, leading to the award of B. Eng., PGD, M. Eng and PhD degrees. From 2001 to date, Prof. Uche has been involved in the training of over 1000 undergraduate students and 300 postgraduate students. He has over 100 scholarly publications in reputable journals/conferences in and outside Nigeria. An author of 'The Fundamentals of Engineer in His Society' (2010), amongst other book chapters in peer-reviewed textbooks.

Engr. Prof. O.A.U. Uche, FNSE is a Fellow of the Nigerian Society of Engineers (FNSE), a Fellow of the Nigerian Institution of Civil Engineers (FNICE), a COREN Registered Engineer, a member of the American Concrete Institute (ACI) and a member of the Materials Society of Nigeria, among other associations. He served as Chairman of Nigerian Society of Engineers (NSE) Kano and Kabuga Branches between 2010-2012 and 2016-2019, respectively, among other services to the Society. Served in Various committees of the COREN Council since 2014.

A devout Christian of the Methodist Church Nigeria, served as a Diocesan Technical Adviser and Lay President of the Methodist Church Nigeria, Kano Diocese. Engr. Prof. O.A.U. Uche is a Worthy Knight of John Wesley (KJW) of the Methodist Church Nigeria. He is happily married to Lady Ngozi Uche with four amiable and adorable children (Chukwunweizu, Amarachukwu, Tochukwu and Chimeremeze).

Engr. Prof. Akindele Folarin Alonge

(FNSE, FIAABE, FAEng, FNIAE, FSESN, FNISafetyE, MASABE, MCSBE, MNIFST, MNIM, MISHS, MISFAE, MPASAE, R.ENG (COREN))

Dean, Faculty of Engineering, University of Uyo, Uyo, Akwa Ibom State, Nigeria (2021 till date)

A Professor of Agricultural and Food Engineering and Consultant

National Chairman of Nigerian Institution of Agricultural Engineers (May 2021 to Nov 2023)

Honourary President of International Commission of Agricultural and Biosystems Engineers

Professor Akindele Folarin Alonge is a Past President of International Commission of Agricultural and Biosystems Engineers (CIGR) and a Fellow of the International Academy of Agricultural and Biosystems Engineers (FIAABE). CIGR is the umbrella body of the Society of Agricultural Engineers worldwide. He is a Fellow of the Academy of Engineering of Nigeria (FAEng). He is the current Dean of the Faculty of Engineering, University of Uyo, Uyo in Akwa Ibom State. He is the immediate past National Chairman of Nigerian Institution of Agricultural Engineers (NIAE). He is also a Fellow of the Nigerian Society of Enginners (FNSE); a Fellow of the Nigerian Institution of Safety Engineers (FNISafetyE) and a Fellow of the Solar Energy Society of Nigeria (FSESN)

He holds a Bachelors and Masters in Agricultural Engineering with specialization in Crop Processing and Storage (aka Postharvest Technology) from the University of Ibadan, Nigeria. He also holds a Ph.D from University of Ilorin, Nigeria in Agricultural Engineering with special interest in Solar drying and by extension renewable energy. He has over 150 publications both locally and internationally and presented over 55 invited and lead papers. He is an associate editor of three journals and he review papers for over fifteen international journals. He is the Pioneer Editor of the Journal of Research and Innovations in Engineering (JORIE) - the Faculty of Engineering, University of Uyo Journal. He is an Advisory Board Member of two Internationals in China (International Journal of Agricultural and Biosystems Engineering (IJABE)), Japan (Agricultural Mechanization on Asia, Africa and Latin America (AMA)) and two Nigerian journals (Arid Zone Journal of Engineering, Technology and Environment, University of Maiduguri and Umudike Journal of Engineering of Michael Okpara University of Agriculture.

He won the Graduate Engineer of the year 1989 of the Nigerian Society of Engineers (NSE), Ibadan as well as Sahara Engineers' Best Paper in Mechanical Engineering and Pa Adeniyi William overall best paper in Engineering. He has been a Corporate member of NSE since 1995. He has served and still serving in several committees of NSE. He started his career as a youth corper in the Department of Agricultural Engineering, University of Ilorin in September 1987, returned as an Assistant Lecturer in January 1991 and rose through the ranks to Senior Lecturer in 2006. He transferred his service to become an Associate Professor in University of Uyo in 2008 and a Professor in 2011. He has supervised over 120 undergraduate and postgraduate students at both University of Ilorin and University of Uyo respectively. He has been an external examiner to both undergraduate and postgraduate students in several universities in Nigeria as well as University of KwaZulu-Natal, South Africa and Universiti Putra, Malaysia. He has assessed over 30 professorial candidates in several universities in Nigeria as well as Canadian and South African Universities respectively.

He is a registered Engineer with the Council for the Regulation of Engineering in Nigeria (COREN). He has been a member of Canadian Society of BioEngineering (CSBE) since 2007. He has also been an active member of American Society of Agricultural and Biological Engineers (ASABE). He has served in several committees of ASABE. He has served as the President of African Network Group of the ASABE. His commitment with ASABE for several years were with lots of success stories from initiating the ASABE-NIAE partnership to establishment of African Network Group of ASABE, to appointment by board of Trustees of ASABE as her representative in the Executive Board of CIGR for over four years, Chair of International Affairs of ASABE etc. The ASABE President gave an Award during the Virtual Conference of ASABE in July 2020 for all these contributions. He has won several other national and international awards.

He is a member of the International Advisory Committee of the International Conference on Agricultural and Food Engineering (CAFEi), Universiti Putra, Malaysia. He is a Member of Nigerian Institute of Management (NIM) Chartered. He is a Fellow of Nigerian Society of Engineers, Fellow of Nigerian Institution of Agricultural Engineers and a Fellow of Solar Energy Society of Nigeria. He is a recipient of several awards within and outside Nigeria. He is a member of the International Soil Tillage Research Organisation (ISTRO). He is also a member of Nigerian Institute of Food Science and Technologists (NIFST). He has attended and presented papers in over fifty five (60) local conferences and over fitty (55) international conferences. His extension work has taken him to almost all the states in Nigeria, some West Africa states, South Africa, USA, Canada, France, Australia, Italy, Netherlands, Germany, Sweden, Japan, China, UAE, Oman and several other nations of the world for conferences, training, workshops, fellowship and visits.

He served as the Head of Department as well as the Vice Dean, Faculty of Engineering, University of Uyo, Nigeria from September 2010 till January 2015. He has served and still serving in several committees of the University. He was on Sabbatical leave as the Director of Membership Services at the Nigerian Society of Engineers (NSE) Headquarters, Abuja in 2015. He has been a COREN Resource person in accreditation exercise for several years as well as Resource Person for National Universities Commission (NUC). He was a Visiting Professor to Bioresources Engineering, McGill University, Canada (2016) and Virginia State Polytechnic and University, Blacksburg, USA (July 2007). He is married to Catherine Modupe Alonge, a University Deputy Registrar and he is blessed with a good family.

Engr. Prof. Adeyinka Olayemi Moses Adeoye

Engr. Prof. Adeyinka Olayemi Moses Adeoye is an internationally recognized expert of Mechatronics Engineering Systems, Project Management and Product Design. Within a career that spans almost three (3) decades, Prof. A. O. M. Adeoye has both the academia and industry experience; he has consulted for many organizations, mentored and trained other seasoned engineers and executives in Nigeria.

Born over five (5) decades ago, Prof. A. O. M. Adeoye received his Master of Science (M. Sc.) and Doctor of Philosophy (Ph. D.) degrees from the Dublin City University, Dublin, Ireland. Prior to joining the University, he was with the World Mission Agency Incorporated, Canaan Land, Ota, Ogun-State between August 2000 and March 2004 where he served as a Project Mechanical Engineer. He was a member of the project management team that was responsible for designing and developing engineering systems for the implementation of the Canaan Land Master Plan which includes Covenant University Project Phase I and II and other important quality assurance tests. He worked as a Research Fellow at the Dublin City University, Dublin, Ireland between September 2007 and September 2009. Other previously held senior management positions and commitments with rich work experiences and responsibilities include Director of Works, Member of COREN Accreditation Team, Member of COREN Engineering Regulatory Monitoring (ERM) Committee- Ekiti State Chapter, Member of NUC Accreditation Team, Project Manager and Coordinator, College level adviser, Pioneering Head of Department of Mechanical and Mechatronics Engineering, College examination officer, Acting Dean of Student Affairs, Acting Provost of College of Engineering, and so on.

Prof. A. O. M. Adeoye is currently the Head of Mechanical and Mechatronics Engineering Department at Afe Babalola University, Ado-Ekiti (ABUAD). His professional research and publication interests include Artificial Neural Networks, Artificial Intelligence, Product Hierarchy and Classification, and Customer-Led Designs; he has over forty-five (45) published articles in national and international reputable journals and conference proceedings. He has accessed a number of professorial candidates in different institutions and he is also currently the Director of Projects and Physical Planning in the same institution with numerous administrative and professional achievements such as the:

a) Supervision of Olympic standard swimming pool in ABUAD (Completed)

b) Supervision of the ABUAD Research Industrial Park construction (completed);

c) Supervision of ABUAD Dam Weir on Elemi River construction (ongoing);

d) Supervision of the 5.4 MW Gas Power Station (Completed);

e) Supervision of the ABUAD Multisystem Hospital project- reputed to be the fastest teaching hospital construction;

f) Supervision of the College of Engineering building complex- reputed to be the largest engineering complex in West Africa;

g) Supervision of the ABUAD Talent Discovery Centre- reputed to be one of the best sport complexes around;

h) Supervision of construction of S. E. Bogoro Research Center, College buildings, ABUAD Cafeteria and supermarkets, ABUAD International School, Students Halls of Residence, University Staff Housing, Clinical Laboratories, University Senate Building (White Rock), Residential buildings for Chancellor, Pro-Chancellor and other Principal Officers of the University and many more.

He is a registered engineer at the Council for the Regulation of Engineering in Nigeria (COREN). He is a member of many other professional bodies such as: The Nigerian Society of Engineers (NSE), American Society of Mechanical Engineers, and Institute of Engineers Ireland. In addition he is an Associate member of Nigerian Institute of Management and an Affiliate member of Institute of Mechanical Engineers in England. Prof A. O. M. Adeoye is an accomplished professional who has received fellowship, scholarship, commendations and honors; some of which are: EU-funded FP6 Innovative Production Machines and Systems Networks of Excellence, award as the most productive staff, the best utility teacher, the most engaged lecturer, most persevering lecturer and so on. He is married to his lovely wife and the union is blessed with two beautiful children.

Engr. Dr. Jude Ifeanyichukwu Igboabuchi, FNSE, FNICE

Pillar of Abuja's Infrastructure Development

Engr. Dr. Jude Ifeanyichukwu Igboabuchi stands as a cornerstone of engineering excellence within Nigeria's Federal Capital Territory. A COREN-registered Civil Engineer and distinguished Fellow of both the Nigerian Society of Engineers and the Nigerian Institution of Civil Engineers (FNICE), his career exemplifies profound dedication to national infrastructure development.

Hailing from Anambra State, Dr. Igboabuchi graduated with a B.Eng. (Hons) in Civil Engineering from the University of Nigeria, Nsukka, in 1988. He joined the Federal Capital Development Authority (FCDA) in 1990, rising steadily through the ranks to his current position as Acting Director of Engineering Services. Over a remarkable 35-year tenure, he has been instrumental in translating the Abuja Master Plan into reality.

His leadership has directly shaped critical infrastructure across the capital. He spearheaded the supervision of complex, large-scale projects including the comprehensive Engineering Infrastructure development for Jabi District (Phases I, II, and Variation Contract), the vital Wuye Sewage Treatment Plant, and the significant expansion of the Nnamdi Azikiwe International Airport (Phase II). This latter project notably enhanced passenger capacity to 1.7 million annually and modernized terminal facilities. He also oversaw crucial works like the Katampe District PPP infrastructure, sections of the Outer Southern Expressway (OSEX Stage III), and the Inner Northern Expressway (INEX).

Beyond project execution, Dr. Igboabuchi is a trusted advisor. He has chaired or served on over 25 pivotal technical committees for the Federal Government, reviewing masterplans (Abuja Water & Sewage, Abuja Rail Mass Transit), evaluating major tenders, vetting designs (Bill Clinton Drive, INEX), and ensuring adherence to the Abuja Master Plan. His expertise spans Project Management, Urban Infrastructure, PPP, and Procurement.

His contributions are recognized through prestigious awards, including a Humanitarian Services Award and an Honorary Doctorate. A committed professional and active NSE member, Engr. Dr. Igboabuchi remains a driving force in building a prosperous Abuja.

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Dr Ada Mac-Ozigbo

Researcher, Author and Leader

Dr Ada Mac-Ozigbo is a Lecturer in the Department of Business Administration, Faculty of Management Sciences, at the National Open University of Nigeria. She holds a degree in Chemical Engineering (COREN-certified), and is a Doctor of Strategic Management. Her multidisciplinary expertise has made her a dynamic contributor to academia and industry alike.

A prolific researcher and published author, Ada Mac-Ozigbo has contributed to numerous national and international journals, making a measurable impact in her fields of specialization. She has actively participated in a wide range of conferences and workshops focused on capacity building and professional development. Ada Mac-Ozigbo's professional recognition includes induction into the halls of fame of several reputable organizations and associations, such as:

- The Nigerian Institute of Management (Chartered) – NIM,
- The Academy of Management Nigeria (TAMN),
- The Association of Management and Social Sciences Researchers of Nigeria (AMSSRN),
- The Association of Entrepreneurship Scholars (AES),
- The Nigerian Society of Engineers (NSE),
- The Rotary Club International, among others.

She serves in multiple leadership and editorial roles, including as a board member, reviewer, and managing editor for academic journals. She has also received numerous awards recognizing her contributions to academia and public service. Her vast professional experience has endowed her with a robust competency framework, which she has strategically applied to drive transformation across various institutions and projects.

Ada Mac-Ozigbo is currently the Coordinator of the Commonwealth Executive MBA Programme at the National Open University of Nigeria. She also serves as the Chairperson of the Abuja and District Society of the Association of Management and Social Sciences Researchers of Nigeria. In the private sector, she is the CEO of Wireless Options Ltd and the Executive Director of Green Gardens Consultants Ltd.

Beyond her professional life, Ada Mac-Ozigbo is a wife, mother, counselor, ethicist, and a distinguished administrator. She is passionate about reading and writing, and continues to inspire excellence across academic, professional, and community landscapes.

Engr. Michael Olusegun Onafowokan, FNSE

"A Visionary Engineer and Transformational Leader"

With a sterling academic foundation— holding a Master of Engineering in Chemical Engineering, a Bachelor of Engineering and a Diploma in Industrial Studies from Loughborough University respectively— Mr. Michael Olusegun Onafowokan stands as a paragon of excellence in the engineering and manufacturing sectors. His journey, marked by relentless innovation and strategic foresight, has left an indelible mark on Nigeria's industrial landscape.

As the **Executive Director of Coleman Technical Industries Limited**, Mr. Onafowokan has been a driving force behind the company's meteoric rise. His mastery of engineering principles, coupled with his sharp business acumen, has propelled the firm to new heights, ensuring its dominance in the production of high quality electrical cables and wires. Under his astute leadership, Coleman has not only expanded its operational capacity but also pioneered cutting-edge technologies, setting unparalleled standards in the industry. Mr. Onafowokan pioneered all certifications for Coleman Technical Industries Limited - ISO certifications, ISO/IEC certification, to mention but a few.

A true polymath, Mr. Onafowokan excels in multiple domains—engineering, project management, production control, quality management and marketing. His ability to harmonize technical precision with commercial strategy has resulted in optimized processes, enhanced profitability, and sustained client satisfaction. His tenure has been characterized by groundbreaking initiatives, including the implementation of advanced manufacturing systems and the mentorship of a highly skilled workforce, fostering a culture of excellence and innovation.

Beyond the boardroom, Mr. Onafowokan is a dedicated professional and community leader. His active membership in prestigious institutions such as the **Royal Institution of Chemical Engineers (ICHEME)** and the **Nigerian Society of Engineers (NSE)** underscores his commitment to advancing the field.

Mr. Onafowokan is a distinguished professional with notable credentials, including membership in the Council for the Regulation of Engineering in Nigeria (COREN). He is also an active member of several Technical Committees of the Standards Organisation of Nigeria (SON), showcasing his expertise in standardization. Furthermore, Mr. Onafowokan serves as a member of the Sector Skills Council of Nigeria, where he chairs the Certification Subcommittee, underscoring his leadership in skills development and certification.

A man of integrity and vision, Mr. Onafowokan's leadership transcends business success. His contributions to staff development, regulatory collaboration, and industry best practices have cemented his reputation as a transformative figure in Nigeria's manufacturing sector.

Mr. Michael Olusegun Onafowokan is not just an engineer and executive; he is a beacon of inspiration—a leader who embodies technical brilliance with unwavering dedication to growth and community impact. Mr. Michael Olusegun Onafowokan enjoys a fulfilling marriage and is the proud father of wonderful children.

Prof. Maikano Mohammed Ari

Championing Agriculture, Policy, and Sustainable Development in Nigeria

Prof. Maikano Mohammed Ari, Deputy Vice Chancellor (Academic) of Nasarawa State University, Keffi, is widely recognized as one of Nigeria's leading experts in agricultural development, livestock systems, and policy advocacy. With over two decades of experience cutting across academia, government, and international development, Prof. Ari has carved a niche as a transformative leader in agriculture, health, and social sector interventions.

A Professor of Animal Science with a PhD in Animal Nutrition, Prof. Ari is highly respected for his contributions to agricultural education, research, and practice. His academic career spans teaching, research, mentoring, and administration, having served as Head of Department, Dean, Director of Quality Assurance, and now Deputy Vice Chancellor (Academic) at Nasarawa State University, Keffi. He has also been instrumental in curriculum development, agripreneurship training, and livestock enterprise development for youth and rural communities.

Beyond academia, Prof. Ari's influence extends to public service and consultancy. From 2007 to 2011, he served as Special Adviser to the Executive Governor of Nasarawa State on Inter-Governmental and Multilateral Cooperation, where he led several landmark projects, including the Millennium Development Goals (MDGs) Conditional Grant Scheme, World Bank-assisted Community and Social Development Projects, and the development of the State's Vision 20:2020 plan.

As a seasoned consultant, Prof. Ari has provided technical expertise to numerous national and international organizations, including the World Bank, FAO, UNICEF, DFID, USAID, and the European Union. His consulting work covers strategic programme design, livestock policy, food systems strengthening, agricultural value chains, monitoring and evaluation, and rural enterprise development.

Prof. Ari currently serves as President of the Nigeria Feed and Fodder Multistakeholders Platform, where he continues to promote collaboration among farmers, researchers, private sector actors, and policymakers to improve livestock productivity and sustainability in Nigeria.

A passionate advocate for inclusive development, Prof. Ari has been at the forefront of many capacity-building initiatives, mentoring the next generation of agricultural professionals while advancing research on animal nutrition, poultry production, and feed systems. He has represented Nigeria at several international conferences in Australia, Kenya, the Netherlands, and the USA, sharing best practices in livestock production and agricultural entrepreneurship.

Prof. Ari's commitment to sustainable agriculture, community development, and knowledge sharing underscores his reputation as a respected thought leader and changemaker in Nigeria's agricultural landscape

Engr. Abubakar Mu'azu Halilu, FNSE ,FNICE

Executive Secretary of the Nigerian Society of Engineers

Born on 1st January 1957 at Bajoga ward of Gombe Local Gernment to the family of the renowned public servant and a community leader, Alh. Mu'azu Halilu (Ubandoman Gombe), Engr Abubakar Mu'azu attended Tudun Wada Primary School Gombe, from 1964 to 1970. Having completed his secondary school education from 1971 to 1975 at the famous Government Science Secondary School Gombe, with flying colours. He proceeded to the Kaduna Polytechnic to obtain a diploma and a higher national diploma in civil engineering (water options) in 1982. He also acquired a Post Graduate Diploma in Civil Engineering from ATBU Bauchi, in 2001.

Engr. Mu'azu attended courses within and outside the country, among which are a short Course in Water Planning at the National Water Resource Institute Kaduna, Water Resources Technology at the University of Birmingham, UK, a Computer Training Workshop and Operation & Maintenance at M & W Corp. USA, a Professional Course on Middle Management Refresher Course at UBRBDA Yola, International Workshop in Dams Safety Operations & Maintenance at JAPCON Consultants, Ikeja, Lagos, International Course on Small Hydropower (SHP) Development at Indian Institute of Technology, Roorkee, India, National Workshop on Capacity Building on Small Hydropower Development at ATBU Bauchi, United Nations Industrial Development Organization (UNIDO-SHP) Workshop on SHP Site Evaluation & Policy Strategies at Hangzhou P.R. China, International Association of Hydrological Sciences General Assembly at Perugia Italy, International Commission of Large Dams Annual General Meeting, ICOLD AGM at Sofia, Bulgaria, International Conference on Dams & Hydropower in Africa at African Union & Ethiopian Electricity Corporation, Water for Society Swedish International Water Institute (SIWI) World Water Week (2019), Workshop on Leadership and Strategic Management at The Administrative Staff College of Nigeria, Topo, Badagry, Capacity building training at ASCON Badagry Batch 3, training of MDs, DGs & CEOs of all FGN MDAs, Agencies and Institutions.

Given his commitment and selfless service to the nation, Engr Abubakar Mu'azu got the following decorations in his career. They include; Africa's patriotic Personality of the Year 2018, by the League of Africa Development Students. Nigeria's Selfless Service Gold Award, 2018 edition. Life Ambassador of Peace, Leadership Award (2019). Honorary Doctorate in water science in 2022. The achiever per excellence award by Arewa Youth Forum, 2024.

Appointments held by this great son of the land include among others:

N.Y.S.C. Primary assignment at National Water Resources Institute Mando Road Kaduna from October 1982 to September 1983. **Asst. Lecturer** – National Water Resources Institute Mando Road Kaduna Oct. 1983 – Sept 1988. He joined the Upper Benue River Basin Development Authority by transfer of service as a **Principal Technical Officer (Hydrology)** in charge of the Authority's Hydrometeorological section 1988-1992. He was promoted to a **Project Manager** in charge of Administration of Personnel, Operations & Maintenance of Dam infrastructure. Feb, 1992- Dec, 1999. Then he rose through the rank and file to become **an Assistant Director (Operations), Deputy Director (Operations), and Executive Director (Engineering)** of the Authority**.** During which he worked as the **Project Co-coordinator of UNIDO-SHP Pilot Projects and Project Coordinator** of USTDA commissioned Consultant, for the **feasibility of Kiri Dam hydropower** done by M/S Princeton Energy Resources International USA. He worked on secondment as **Special Assistant on Hydropower to the Minister of State for Power from June 2010 to May 2011**. He has worked as a **Part-time Lecturer (1)** at the Modibbo Adama University of Technology, Yola (MAUTECH), Department of Agric & Environmental Engineering, from January 2012 to December 2012.

Engineer Mu'azu was **Appointed Managing Director (CEO) of the Authority in June 2016 by Mr President and Commander in Chief Muhammadu Buhari GCFR;** he was **Reappointed Managing Director (CEO) of the Authority in June 2020 for a second term; and bowed out of office in the 6th of June 2024, following his tenure expiration.** After leaving public service, he was conferred the traditional title of "Wakili Koguna" (meaning the river envoy of HRH) by HRH the Emir (Lamido) of Adamawa (Fombina) Emirates in July 2024. Engr Mu'azu is the current Executive Secretary of the Nigerian Society of Engineers.

His memberships include: Member Nigeria National Committee for International Hydrological Programs for UNESCO (NC-IHP UNESCO) from 1988 to date. Member Nigerian Association of Hydrological Sciences (NAHS) 2004. Member International Association of Hydrological Sciences (IAHS) 2004. Registered Engineer (COREN), Nigeria. 2003. Member International Network on Small Hydro Power for UNIDO (SHP) 2004. Member Nigerian Society of Engineers (MNSE) 2006. Member Nigerian National Committee on Large Dams/ NICOLD and the International Commission on Large Dams (ICOLD) 2006. Corporate Member International Hydropower Association (IHA) 2014.

He was conferred with a distinguished Fellowship award from the Nigerian Society of Engineers (FNSE) in 2017 and a Fellowship award from the Nigerian Institute of Civil Engineering (FNICE) in 2021.

NSE President Highlights Role of Engineering in Smart Cities at 55th Ghana Engineering Conference

...Reaffirms Commitment to Strengthening Partnership with Ghana Institution of Engineering

Accra, Ghana – The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has emphasized the critical role of Engineering in developing smart cities and sustainable urban infrastructure. Speaking at the Opening ceremony of the 55th Annual General Meeting and Conference of the Ghana Institution of Engineering (GhIE), at the Mövenpick Ambassador Hotel, Accra, she reaffirmed NSE's commitment to strengthening partnerships with the Ghana Institution of Engineering and other Sister Institutions to drive technological advancement and sustainable development across the continent.

Themed "Urbanization and Smart Cities: Engineering the Future of Ghana", the conference brought together distinguished Engineers, policymakers, and industry leaders to discuss innovative strategies for sustainable urban development and the role of Engineering in shaping Ghana's cities of the future.

In her goodwill message, NSE President commended the Ghana Institution of Engineering for its dedication to advancing Engineering excellence and fostering regional collaborations to address the challenges posed by rapid urbanization. She highlighted the critical role of engineers in developing smart cities, resilient infrastructure, and sustainable urban ecosystems to support growing populations.

Engr. Oguntala

"As Engineers, we must continue to harness emerging technologies and innovative solutions to create smart, inclusive, and sustainable cities. Collaboration across borders is essential in achieving this vision, and I am delighted to witness the synergy between Engineering bodies in Africa," she stated.

The 55th Annual General Meeting and Conference of GhIE serves as a strategic platform for knowledge exchange, innovation, and policy recommendations aimed at Engineering a smarter and more sustainable future for Ghanaian cities.

NSE Council Celebrates Engr Dr. F. A. Shonubi at 90

The Council of the Nigerian Society of Engineers (NSE) honored its Past President, Engr Dr. F. A. Shonubi, FNSE, on the occasion of his 90th birthday during its Council Meeting held on March 13, 2025, at the NEC Building, NSE Headquarters, Abuja.

In her goodwill message, the President and Chairman-in-Council, Engr. Margaret Aina Oguntala, FNSE, congratulated Dr Shonubi, acknowledging his immense contributions to the Engineering profession and the NSE Council. She emphasized that the Council has greatly benefited from his wealth of experience, leadership, and dedication to the advancement of Engineering in Nigeria.

Engr. Dr. Folasodun Adebisi Shonubi, FNSE. FAEng

Engr. Dr. F. A. Shonubi, FNSE, served as the 17th President of the Society from 1991 to 1992. His legacy in Engineering development, mentorship, and professional excellence continues to inspire generations of Engineers.

The NSE Council expressed profound appreciation for his unwavering commitment to the Society and wished him continued good health and strength.


Group photograph with the NSE President, Deputy President and some Past Presidents of the Society


L-R: NSE President, Engr. Margaret Aina Oguntala, FNSE, the Celebrant and the Deputy President, Engr. Ali A. Rabiu, FNSE, FAEng, MFR


Group photograph with the NSE National Executive Committee Members

NSE President Congratulates High Chief Dr. Leemon Ikpea, CON (FNSE) on His Honorary Doctor of Engineering from FUPRE

The President and Chairman-in-Council of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has congratulated High Chief Dr. Leemon Ikpea, CON (FNSE), JP, Group Chairman, Lee Engineering Group and Allied Companies Limited, on the conferment of an Honorary Doctor of Engineering by the Federal University of Petroleum Resources, Effurun (FUPRE).

While attending the conferment ceremony at the institution's convocation on 15th March 2025, the NSE President commended Dr. Ikpea's unwavering commitment to the empowerment of Engineers and the advancement of Engineering technology in the oil and gas industry. She noted that this dedication had earlier earned him the prestigious title of Honorary Fellow of NSE. Both honors, she emphasized, attest to his inspiring and visionary leadership acumen as well as his deep-seated love for Nigeria.

The President prayed for continued success in his endeavors and expressed hope that these accolades would serve as motivation for even greater contributions to the development of our fatherland.

Right: President of NSE, Engr. Margaret Aina Oguntala, FNSE congratulates High Chief Dr. Leemon Ikea, CON (FNSE)

A day earlier, before the conferment, the NSE President had paid a technical visit to the corporate headquarters of Lee Engineering Limited in Warri with her team. The visit provided an opportunity to engage with the management and staff of the company, gain insights into its cutting-edge Engineering operations, and further strengthen collaboration between NSE and one of Nigeria's foremost indigenous Engineering firms.

The NSE President in a group photograph with LEE Engineering Group Staff

NSE President Visits Minister of Power

The President of the Nigerian Society of Engineers (NSE), Engr Margaret Aina Oguntala, FNSE, led a delegation on a courtesy visit to the Honourable Minister of Power, Chief Adedayo Adelabu, OFR to discuss key areas of collaboration between the Society and the Ministry.

During the meeting, discussions centred on collaborations, strategic partnerships, mentorship opportunities, and the crucial role of NSE in providing technical advisory support to the Ministry on power-related issues. The NSE President emphasized the Society's commitment to contributing technical expertise toward improving Nigeria's power sector, fostering innovation, and enhancing capacity development within the industry.

The Honourable Minister appreciated the NSE President's initiative and expressed his willingness to work closely with the Society in addressing critical power challenges. He acknowledged the importance of Engineers in shaping sustainable power solutions and assured the delegation of the Ministry's openness to deeper collaboration.

Right: President of NSE, Engr. Margaret Aina Oguntala, FNSE presents a Plaque to the Hon. Minister of Power, Chief Adedayo Adelabu, OFR

This engagement marks a significant step in strengthening professional partnerships between NSE and the government, reinforcing the Society's role in national development.

Group photograph

NSE, NBTI Collaborate to Boost Technological Advancement in Nigeria

Right: President of NSE, Engr. Margaret Aina Oguntala, FNSE and NBTI Director General, Dr. Kazeem Kolawole Raji

The Nigerian Society of Engineers (NSE) and the National Board for Technology Incubation (NBTI) have partnered to enhance the commercial viability of research discoveries and drive technological innovation in Nigeria. This collaboration was discussed during a meeting between NSE President, Engr. Margaret Aina Oguntala, FNSE, and NBTI Director General, Dr. Kazeem Kolawole Raji, few days ago in Abuja. The goal is to bridge the gap between research and industrialization, ensuring that Engineering-led innovations contribute meaningfully to national development.

NSE President also proposed the revival of the Junior Engineers, Technologists, and Scientists (JETS) Club in secondary schools to inspire young Nigerians in Engineering and technology. Additionally, she invited NBTI to participate in NSE's International Conference and AGM, themed "Engineering Innovation for a Sustainable Blue Economy", scheduled for December 1–5, 2025.

Dr. Raji praised Nigerian Engineers for their adaptability, recalling their success in mastering mobile telecommunications technology in Nigeria's early years. He emphasized that Engineering and scientific expertise are crucial for industrialization, particularly as Nigeria seeks to align with the BRICS nations and transition into a knowledge-driven economy. He also reaffirmed NBTI's commitment to emerging technologies such as Artificial Intelligence (AI), robotics, and nanotechnology, stressing that Engineers must lead this transformation, not graduates of liberal arts or humanities.

Both organizations reaffirmed their commitment to fostering Engineering-driven innovation, supporting research commercialization, and equipping young Nigerians with practical technological skills. The partnership between NSE and NBTI is expected to accelerate Nigeria's industrial growth, strengthen its technology sector, and create more economic opportunities for Engineers and innovators across the country.

NSE Vice Presidents

Group photograph

NSE President Joins Celebration of World Engineering Day at UNESCO Headquarters, Paris

Paris, France – March 4, 2025. The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE joined global Engineering leaders, policymakers, and stakeholders at the World Engineering Day for Sustainable Development celebration held at the UNESCO Headquarters in Paris, France.

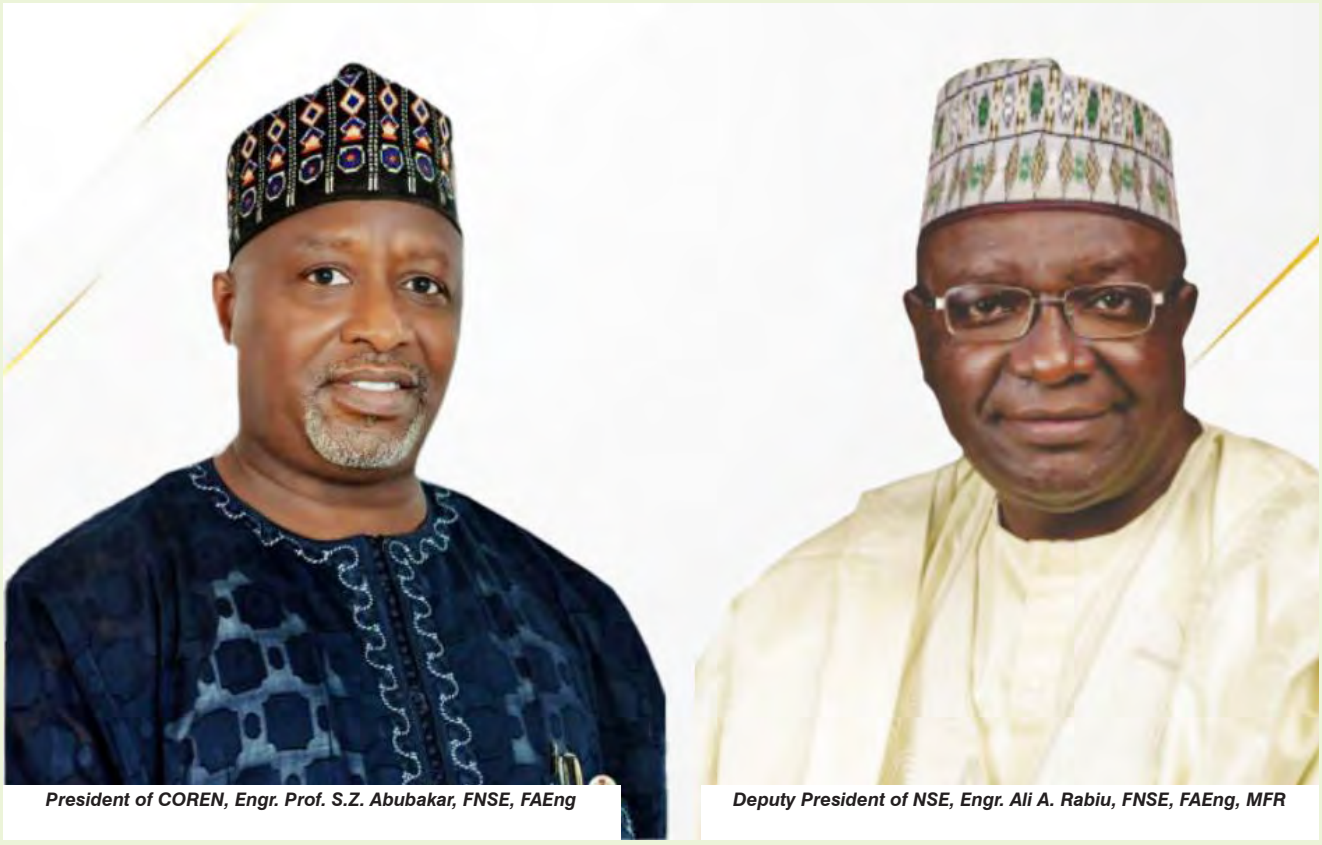
The event, themed "Shaping a Sustainable Future Through Engineering," brought together professionals from around the world to discuss the critical role of Engineering in tackling global challenges such as climate change, infrastructure development, digital transformation, and sustainable energy solutions.

The NSE President represented Nigeria's Engineering community, highlighting the nation's contributions to Engineering advancements and sustainable development. The participation of NSE at this prestigious global gathering aligns with one of the key pillars of the NSE Strategic Agenda—Fostering International Relations. This underscores NSE's commitment to strengthening global collaborations, knowledge exchange, and positioning Nigerian Engineers as key players on the international stage.

The NSE President, Engr. Margaret Aina Oguntala, FNSE (3rd from left), WFEO President, Engr. Mustafa Balarabe Shehu, FNSE, FAEng (middle) and other delegates

The Nigerian Society of Engineers remains dedicated to professional excellence, capacity building, and fostering international relationships that will further strengthen Nigeria's position in the global Engineering ecosystem.

NSE President Felicitates with Deputy President Rabiu and COREN President Abubakar on Their Birthday



President of COREN, Engr. Prof. S.Z. Abubakar, FNSE, FAEng

Deputy President of NSE, Engr. Ali A. Rabiu, FNSE, FAEng, MFR

The President of the Nigerian Society of Engineers (NSE), Engr Margaret Aina Oguntala, FNSE, has extended warm felicitations to the Deputy President of NSE, Engr Alimasuya Rabiu, FNSE, FAEng, MFR and the President of the Council for the Regulation of Engineering in Nigeria (COREN), Engr Prof S.Z. Abubakar, FNSE, FAEng as they both celebrate their birthday today, 24th April 2025.

In a goodwill message issued on behalf of the Council and entire membership of the Nigerian Society of Engineers, NSE President praised the duo for their exemplary leadership, commitment, and outstanding contributions to the Engineering profession in Nigeria.

She stated, "Today, we celebrate two illustrious figures whose unwavering dedication and visionary leadership have elevated the practice of Engineering across the country. Engr Rabiu and Engr Prof Abubakar are beacons of professionalism, integrity and excellence, serving as role models to several Engineers and making significant impacts in national development. Their exceptional service continues to inspire the next generation of Engineers."

While congratulating them on their new age, NSE President prayed for continued wisdom, good health and success for the celebrants as they jointly steer the Engineering profession to greater heights.

"On behalf of the NSE Council and the entire engineering community, I wish Engr Alimasuya Rabiu and Engr Prof S.Z. Abubakar happy birthday filled with joy, fulfillment, and greater achievements in the years ahead," the statement read.

Honourable Minister of State for Works Visits NSE President to Strengthen Engineering Collaboration

The Honourable Minister of State for Works, Barrister Bello Muhammad Goronyo, paid a courtesy visit to the President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, at the NSE Headquarters in Abuja. The visit was geared towards strengthening collaboration between the Federal Ministry of Works and the NSE to promote Engineering excellence and drive sustainable infrastructure development across Nigeria.

Left: President of NSE, Engr. Margaret Aina Oguntala, FNSE explaining a point to the Hon. Minister of State for Works, Barr. Bello Muhammad Goronyo

During the high-level meeting, both parties exchanged ideas on how to better integrate the Engineering profession into the fabric of national development. The NSE President underscored the critical need for involving qualified and professional Engineers in all phases of infrastructure projects—from planning to execution—to ensure quality delivery and long-term sustainability.

She reiterated the NSE's unwavering commitment to supporting government efforts through technical expertise, policy advice, and capacity development initiatives that align with global best practices.

In response, Hon Minister commended the contributions of Nigerian Engineers to the nation's development and affirmed the Ministry's readiness to deepen its partnership with the NSE. He stressed that the collaboration is vital for realizing the Federal Government's infrastructure agenda and for maintaining international standards in project execution.

It will be recalled that the Honourable Minister of State for Works was the representative of His Excellency, President Bola Ahmed Tinubu, GCFR, at the Opening Ceremony of the 2024 NSE National Engineering Conference held in Abuja. His presence at the event further highlighted the administration's recognition of the Engineering profession as a cornerstone of national progress.

The meeting marks a significant step towards fostering a stronger public-private synergy in the Engineering sector and leveraging local capacity for national growth.

Group picture

NSE Commends Gov. Mutfwang for Appointing Seven Engineers into Key State Government Boards and Agencies

...Urges Other Governors to Prioritise the Involvement of Engineers in Leading Engineering MDAs

Engr. Oguntala

Gov. Mutfwang

The Nigerian Society of Engineers (NSE) has expressed profound appreciation to the Governor of Plateau State, Barr. Caleb Manasseh Mutfwang, for appointing seven Engineers as Chief Executive Officers (CEOs) and Board members of various state government Agencies.

In a statement released by the President and Chairman-in-Council of NSE, Engr. Margaret Aina Oguntala, FNSE, the Society described these appointments as the right peg in the right hole, given that the Boards and Agencies in question are Engineering-based. She noted that placing seasoned Engineers at the helm of these institutions will enhance their effectiveness and efficiency, ensuring that technical expertise and best Engineering practices drive infrastructural development in the state.

The NSE President further emphasized that the newly appointed Engineers will bring their wealth of knowledge, experience, and professionalism to bear in their respective roles, contributing significantly to infrastructure development, innovation, and sustainable progress in Plateau State.

Furthermore, NSE President called on other State Governors to prioritize the involvement of Engineers in Engineering-based Ministries, Departments, and Agencies (MDAs). She stated that strategic appointments of this nature would foster rapid economic and infrastructural transformation, ensuring that critical projects meet global Engineering standards while also strengthening local capacity in the sector.

The Nigerian Society of Engineers remains committed to supporting initiatives that promote professionalism in governance and national development. The Society congratulates the newly appointed Engineers and looks forward to seeing their positive impact in advancing Plateau State's Engineering and infrastructural landscape.

NSE, NCAA Forge Strategic Partnership to Boost Capacity of Nigerian Aviation Engineers

The Nigerian Society of Engineers (NSE) and the Nigerian Civil Aviation Authority (NCAA) have agreed to collaborate on capacity building initiatives for aviation Engineers in Nigeria—a move aimed at creating a robust pool of skilled professionals for the country's aviation sector.

This landmark partnership emerged during a courtesy visit by Engr. Margaret Aina Oguntala, FNSE, President of the NSE, to Captain Chris Najomo, Director General and Chief Executive Officer of the NCAA, on Wednesday, April 23, 2025, at the NCAA headquarters in Abuja.

During the meeting, NSE President emphasized the urgent need for collaboration between both institutions, especially in enhancing capacity development for young Engineers entering the industry.

She reiterated NSE's commitment to promoting Engineering excellence and capacity building, underscoring the importance for Nigerian Engineers to keep pace with rapid technological advancements that are transforming the global aviation sector. The President also commended Captain Najomo's leadership for fostering a positive working environment for Engineers within the NCAA, urging him to sustain such favorable conditions.

Engr. Oguntala *Captain Najomo*

In his remarks, Captain Najomo praised the professionalism and dedication of Engineers at the agency and lauded NSE's supportive role. He called on the NSE to engage more deeply in designing safer aviation systems, implementing advanced safety management practices, and pursuing research and development to elevate Nigeria's aviation industry.

"In an industry where safety is paramount, the roles of Engineers and other technical professionals—such as pilots, air traffic controllers, and safety examiners—cannot be overemphasized.", Najomo stated

The partnership is expected to drive ongoing professional development, facilitate knowledge exchange, and promote the use of innovative technology in Nigeria's aviation industry, ensuring that the nation maintains high standards of safety and technical expertise.

The NSE President presenting a plaque to the DG/CEO of NCAA

Group photograph

Oyo State Branches of NSE Host President in Ibadan Ahead of Alaafin of Oyo's Coronation

The Nigerian Society of Engineers (NSE) Branches in Oyo State, comprising Ibadan, Oluyole, Oyo, and Ogbomoso, warmly received the NSE President, Engr. Margaret Aina Oguntala, FNSE, in Ibadan ahead of her attendance at the coronation of His Imperial Majesty, Oba Abimbola Akeem Owoade, the 46th Alaafin of Oyo, who is also an Engineer by profession.

In his welcome address, Engr. Oluwaseun Adeniyi, Chairman of NSE Oyo Branch, expressed appreciation for the President's visit and reaffirmed the commitment of the Oyo State Branches to Engineering excellence. He described the ascension of an Engineer to the revered Alaafin throne as a great honor to the profession and a testament to the role of Engineers in leadership and governance.

The NSE President commended the Oyo State Branches for their unity and dedication to professional advancement. She emphasized the NSE's mission to enhance Engineering practice in Nigeria and highlighted the significance of an Engineer being crowned as Alaafin. She also urged all Branches in Oyo State to remain united as they finalize plans to host the NSE National Conference in December 2025, noting that a successful hosting would further solidify the State's influence in national Engineering development.

Standing: President of NSE, Engr. Margaret Aina Oguntala, FNSE addressing the members of the Branches domiciled in Ibadan

The event concluded with discussions on professional development, and infrastructural collaboration, followed by preparations for the grand coronation. The NSE delegation will be proudly present to celebrate HIM Oba Abimbola Akeem Owoade's ascension, honoring his achievements as both a traditional leader and a distinguished Engineer.

NSE Delegates Attend Coronation of 46th Alaafin of Oyo

The NSE President (4th from right), flanked by other Senior Engineers on the delegation

The Nigerian Society of Engineers (NSE), led by its President and Chairman-in-Council, Engr. Margaret Aina Oguntala, FNSE, joined other dignitaries on Saturday, April 5, 2025, to witness the historic coronation of His Imperial Majesty, Oba Abimbola Akeem Owoade I, the 46th Alaafin of Oyo, who is also an Engineer by profession.

The grand event, held at Oliveth Baptist High School in Oyo, drew prominent traditional rulers, political leaders, and cultural icons from across Nigeria. Governor Seyi Makinde of Oyo State led the official proceedings, presenting the newly crowned Alaafin to the people of Oyo with great fanfare and royal pageantry.

The NSE delegation was proudly present to celebrate His Imperial Majesty, Oba Abimbola Akeem Owoade's ascension—honoring his achievements as both a traditional ruler and a distinguished professional in the field of Engineering.

Group photograph

Group photograph

NSE Congratulates President Tinubu on Appointment of New NNPC CEO and Board Members

Engr. Oguntala

President Tinubu

The Nigerian Society of Engineers (NSE) extends heartfelt congratulations to President Bola Ahmed Tinubu, GCFR, on the appointment of Engr Bashir Bayo Ojulari, FNSE as the new NNPC Group Chief Executive Officer (NNPC GCEO), Engr Ahmadu Musa Kida, FNSE as Non-Executive Chairman of the Nigerian National Petroleum Company Limited (NNPC Ltd), and other board members to steer the affairs of the organisation. This significant decision underscores President Tinubu's unwavering commitment to revitalizing NNPC Ltd and enhancing the energy security of Nigeria through the Oil and Gas sector.

In a press statement signed by the President and Chairman-in-Council of the NSE, Engr. Margaret Aina Oguntala, FNSE, the Society lauded the appointment of seasoned professionals, describing it as "the right peg in the right hole." She commended President Tinubu for ensuring that individuals with vast engineering, technical, and leadership experience are at the helm of NNPC Ltd, a move that aligns with global best practices in energy governance.

The NSE President emphasized that this strategic appointment is pivotal to achieving sustainable energy security, infrastructural growth, and economic development. She further expressed optimism that the new leadership will usher in a transformative era for NNPC Ltd, fostering efficiency, transparency, and innovation in the Oil and Gas sector.

The Nigerian Society of Engineers remains committed to supporting the administration's drive toward national development and energy sustainability and looks forward to a fruitful collaboration with NNPC Ltd under its new leadership.

NSE Institutionalises *Habu Gumel Olympic Marathon*

The Nigerian Society of Engineers (NSE) has institutionalised the Marathon Walk segment of the annual National Engineering Games (NEGG) by renaming it as **Habu Gumel Olympic Marathon**.

The marathon is a key feature of the Nigerian Engineering Games (NEGG).

This was the main agenda of the discussions carried on during the courtesy visit paid on the revered Past President of NSE and President of the Nigerian Olympic Committee (NOC), Engr. Habu Gumel, FNSE, FAEng, OON by the President of NSE, Engr. Margaret Aina Oguntala, FNSE, on Wednesday, April 30, 2025 in Abuja.

The Deputy President of NSE, Engr. Ali A. Rabiu, FNSE, FAEng, MFR, who led the team on behalf of the NSE President, conveyed the Society's hearty congratulations to the NOC President on the steady and impactful strides being recorded by the Nigeria Olympic Committee under his visionary and purposeful leadership. Engr. Rabiu said that Engr. Gumel's commitment to excellence has brought honour to the country through commendable performances on the global sporting stage, noting that members of NSE were thrilled by Engr. Gumel's towering records of success in sports in the country.

"Our visit today is driven by a desire to explore meaningful collaboration between the NSE and the NOC. As a first step, we humbly request an opportunity to formally honour you at an appropriate date, before a full gathering of our Council and members. Also, we are keen on partnering with the NOC in promoting sports development in Nigeria, leveraging initiatives such as the National Engineering Games and other national programmes.

"The Society has scheduled the Opening Ceremony of the Engineering Games to hold on

Middle: Deputy President of NSE, Engr. Ali A. Rabiu, FNSE, FAEng, MFR, flanked by President of the Nigerian Olympic Committee, Engr. Habu Gumel, FNSE, FAEng, OON (left) and Chairman of Engineering Games Committee, Engr. Olu Ogunduyile, FNSE (right)

14th July, 2025 at the Moshood Abiola National Stadium, Abuja. The Games will involve twelve (12) different sports for participants to compete in, including Football, Marathon Walk, Lawn Tennis, Table Tennis, Chess, Scrabble, Ayo, Badminton, Monopoly, Volley Ball, Dancing and Basket Ball.

"We therefore have the pleasure of informing you that NSE, through the Engineering Games Committee under the Chairmanship of Engr. Olu Ogunduyile, FNSE has approved the naming of NEGG Marathon Walk in your honour. Therefore, the hitherto NEGG marathon Walk shall henceforth be referred to as the ***NSE-HABU GUMEL OLYMPIC MARATHON***. This is in recognition of your giant strides in leadership, advocacy and national sports development", Engr Rabiu said.

Accepting the honour, the NOC President, Engr. Habu Gumel said:

"Let me say how grateful, happy and excited I am today for this very important visit by a powerful delegation of the Nigerian Society of Engineers. I thank you for the honour that you have bestowed on me from the bottom of my heart and on behalf of my family and my colleagues here at NOC. I thank you sincerely for this honour of naming the Marathon Walk segment of the National

Engineering Games as **NSE-HABU GUMEL OLYMPIC MARATHON.**

This NSE-NOC collaboration is very important, not only because some of our Engineers are sports men and women, but more because we are working together to promote the engineering profession as well as sporting activities in our country. Even at the level of the International Olympic Committee, there are some of our colleagues that are Engineers. So, this collaboration is important to us and we will do all within our powers to support the sporting initiatives of NSE".

Gov. Makinde Assures NSE of Stellar Hosting for 2025 International Engineering Conference

Engr. Oguntala presents a plaque to Gov. Makinde

May 23, 2025 - Oyo State Governor, Engr. Seyi Makinde, FNSE, has assured the Nigerian Society of Engineers (NSE) of the State Government's full commitment to delivering a world-class hosting of the 2025 International Engineering Conference, Exhibition, and Annual General Meeting (AGM), tagged IBADAN 2025.

The assurance was given during a high-level courtesy visit by the NSE President, Engr. Margaret Aina Oguntala, FNSE, to the Governor in Abuja on Friday, May 23, 2025. The visit formed part of ongoing engagements in preparation for the much-anticipated annual gathering of Engineering professionals from across Nigeria and beyond.

In a significant demonstration of support, Governor Makinde confirmed the approval of NSE's request for the sponsorship of key components of the conference, as well as the hosting of the Spousesâ€™ Forum by Her Excellency, the First Lady of Oyo State, Engr. Tamunominini Makinde. The NSE President described these gestures as visionary, highlighting that they reflect the Governor's strong belief in the pivotal role of Engineering in national development.

The President also expressed profound appreciation to Governor Makinde for graciously accepting to host the conference and for his proactive engagement, which has helped generate widespread enthusiasm for the event.

As preparations intensify for IBADAN 2025, this renewed collaboration between NSE and the Oyo State Government sets a remarkable precedent" one anchored on visionary leadership, professional excellence, and a shared commitment to national transformation through Engineering.

Middle: President of NSE, Engr. Margaret Aina Oguntala, FNSE, 1st from left: Deputy President of NSE, Engr. Ali A. Rabiu, FNSE, FAEng, MFR and Governor of Oyo State, Engr. Seyi Makinde, FNSE

Group picture

NSE President Engages with Houston Branch

Houston, Texas - The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, engaged with members of the NSE Houston Branch during a dinner organized to welcome her to the 2025 Offshore Technology Conference (OTC) in Houston, Texas.

The special dinner brought together esteemed Nigerian Engineers in Houston to foster collaboration with the NSE leadership and also address the concerns of the members of the Branch

Engr. Oguntala

In her welcome address, the Chairman of NSE Houston Branch, Engr. Ngowari Diminas, expressed gratitude to the President for her commitment to engaging the global NSE community and strengthening the bond between the home-based and diaspora Engineers. She reaffirmed the Branch's commitment to the core values of the Society and its support for the current administrationâ€™s vision.

The President, Engr. Margaret Oguntala, FNSE, in her response, appreciated the warm hospitality extended by the Houston Branch and acknowledged the vital role of the diaspora in driving innovation, knowledge exchange, and investment back home. She updated members on the state of affairs at the Headquarters and emphasized the Society's readiness to collaborate with them in repositioning Engineering for national development.

The NSE President is scheduled to participate and speak at sessions of the 2025 Offshore Technology Conference (OTC), where global leaders and professionals in energy, technology, and infrastructure converge to share knowledge and explore opportunities. The evening concluded with a call for continued professional excellence and a renewed sense of collaboration between NSE Branches globally, as well as support for Engineering-led solutions to national and global challenges.

L-R Engr. Simon Ehiemua, Chairman NSE Houston Branch, Engr. Ngowari Diminas, Prof. David Olowokere,; President Nigerian society of Engineers Engr. Margaret OGUNTALA FNSE ; Engr. Joseph Adegun, IPC Houston branch , Engr. Solomon Inikori; and Engr. Babatunde Badru at the Dinner organized by Houston branch in Honour of the President during the 2025 OTC in Houston, Texas

Images from OTC 2025 in Houston, Texas

L-R Chairman of PETAN Engr. Wole Ogunsanya FNSE, Minister of State petroleum (Gas)Hon Ekperikpe Ekpo, Minister of State Petroleum (Oil) Sen Heneiken Lokpobiri ; President Nigerian Society of Engineers Engr. Margaret OGUNTALA FNSE and Executive Secretary NCDMB Engr. Felix Omatshola Ogbe FNSE at the opening ceremony of the 2025 OTC conference in Houston Texas

Tunji Akinwunmi of Total Energies, Engr. Obi Uzu Vice Chairman PETAN ; Chairman PETAN Engr Wole Ogunsanya FNSE; ED OPTS Engr. Gwueke Ajaifia ; Engr Bankole Kalyjaiye at the Nigerian Pavilion of the 2025 OTC in Houston Texas

President Nigerian society of Engineers Engr. Margaret OGUNTALA FNSE, GM Development First Exploration and company Engr. Segun Owolabi and MD IFDC Rngr Solomon Inikori FNSE at the opening Ceremony of 2025 OTC in Houston Texas

L-R Former Exxon mobil USA Engr. Layout Oyeleye; Chief Risk Officer Wema bank Mr Sylvanus Eneche CFA; President during the Nigerian Society of Engineers Engr. Margaret OGUNTALA FNSE; MD IFDC Inc UsA/ Fmr Chairman Houston branch of NSE Engr. Solomon Inikori PhD and MD Protogy Engr. Ademola Agoro FNSE at the opening ceremony of 2025 OTC in Houston Texas

L-R MD PANA Holdings Dr Dere Akobo , President NSE , Engr. Margaret OGUNTALA FNSE and Engr. Lucky Brown of BGAM services Nigeria Ltd

Mrs CHIOMA Okpoechi of Renaissance African Energy Holdings and VP CS Engr. Felicia Agubata PhD, FNSE

Images from OTC 2025 in Houston, Texas

President Nigerian Society of Engineers at LEE Engineering Booth

MD Aradel Holdings with President of NSE at the Dinner organized by PETAN at the OTC

Vice President Corporate Services ,Dr. Felicia Agubata and Mrs Joan Faluyi , MD offshore Dimension.

President NSE Engr. Margaret OGUNTALA FNSE and Executive Secretary NCDMB Engr. Omatshola Ogbe FNSE

Images from OTC 2025 in Houston, Texas

MD offshore dimension Engr. Joan Faluyi ; Chairman PETAN Engr Wole Ogunsanya FNSE; President Nigerian Society of Engineers Engr. Margaret OGUNTALA FNSE; senior Vice President Global region Baker Hughes Tayo Akinokun; MD Lonadek Engr. Ibilola Amao FNSE and Engr. Obi Uzu FNSE at the 2025 OTC in Houston Texas

Wife of PETAN Chairman Mrs Ogunsanya, Minister of State (Gas) Rt. Hon Ekperikpe Ekpo; Chairman PETAN Engr . Wole Ogunsanya FNSE; President Nigerian Society of Engineers Engr. Margaret OGUNTALA FNSE at the PETAN Awards/ Dinner during the 2025 OTC in Houston Texas

MD Anoh Gas Engr. Effiong Okon FNSE , President Nigerian society of Engineers Engr. Margaret OGUNTALA FNSE and Engr. Solomon Inikori FNSE at the opening ceremony of 2025 OTC in Houston Texas

The President with the Honourable Minister of State (Gas) Rt. Hon Ekperikpe Ekpo and the Chairman of PETAN Engr. Wole Ogunsanya FNSE at Luncheon and Panel Session.

L- R President Nigerian Society of Engineers Engr. Margaret Aina OGUNTALA FNSE , Engr. Ebenezer Agwu and Engr. Shola Falade MD Bib star offshore services Ltd at the OTC dinner organized by PETAN

Engr. Nnoli Akpedeye FAEng, FNSE and Vice President Corporate Services Engr. Felicia Agubata PhD, FNSE

NSE President Advocates Alignment of African Engineering Education with Global Standards, Receives Award of Honour at 2025 OTC in Houston

Speaking on how African Engineering institutions can better align with international standards while developing local talent, Engr. Margaret Aina Oguntala, FNSE, President of the Nigerian Society of Engineers (NSE), outlined key strategies including curriculum and faculty development, stronger industry engagement, accreditation, and innovation. She emphasized the importance of contextualizing global best practices to local realities and investing in modern infrastructure, partnerships, and digital tools to bridge the gap between academia and industry.

NSE President delivered these remarks as a panel speaker at the African Content Collaboration Session of the 2025 Offshore Technology Conference (OTC), held on Wednesday, 7th May 2025, at the Wyndham Hotel (formerly Crowne Plaza), Houston, Texas. The session focused on the theme: "Local Content Development and Partnership for Africa's Energy Sustainability."

In recognition of her leadership, vision, and contributions to engineering development in Africa, NSE President was presented with an Award of Honour at the event.

The session concluded with a dynamic Question and Answer segment, during which the NSE President and other panelists engaged participants on effective implementation strategies and regional collaboration.

Her participation at OTC 2025 affirms NSE's central role in shaping discourse on local content and engineering-driven development across the continent.

PETAN Chairman , Engr. Wole Ogunsanya FNSE presenting a plaque to President of NSE Engr. Margaret OGUNTALA FNSE After the technical session at 2025 OTC in Houston Texas

NSE Commends President Tinubu on Approval of Renewed Hope Nigeria-First Procurement Policy

Engr. Oguntala

President Tinubu

The Nigerian Society of Engineers (NSE) has applauded President Bola Ahmed Tinubu and the Federal Government for the approval of the Renewed Hope Nigeria-First Procurement Policy, a groundbreaking move aimed at prioritizing Nigerian goods, services, and know-how in public procurement.

The policy mandates all Ministries, Departments, and Agencies (MDAs) to give utmost priority to local products and services, ensuring that government spending places Nigeria at the heart of every procurement decision. As confirmed by the Minister of Information and National Orientation, Mohammed Idris, this policy is a pivotal step toward empowering local industries, reducing reliance on imports, and promoting economic self-sufficiency.

In a statement signed by its President and Chairman-in-Council, Engr. Margaret Aina Oguntala, FNSE, NSE commends the directive that enforces the procurement of local alternatives, except where no viable local option exists, in which case the Bureau of Public Procurement (BPP) will issue a waiver. This policy is expected to significantly boost local manufacturing, skills development, and technology transfer in Nigeria, contributing to the growth of the economy and job creation.

The Society has also expressed its unwavering support for the policy, and willingness to collaborate with the government to ensure the successful implementation of this policy, providing professional insight, monitoring, and technical expertise.

"We believe that this policy will foster innovation, strengthen Nigeria's Engineering sector, and create sustainable development opportunities for the nation," said Engr. Oguntala.

The NSE urges for the swift issuance of the Executive Order to cement the policy's legal foundation and ensure its effective enforcement.

NSE President Commends NIA's Commitment to Excellence at 65th Anniversary Celebration

Abuja, May 14, 2025 - The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has applauded the Nigerian Institute of Architects (NIA) for its steadfast commitment to excellence, innovation, and national development through architectural advancement.

She made this remark during an interview session at the 65th Anniversary Commemoration of the NIA, held at the Africa Continental Hotel (formerly Sheraton), Abuja. Themed "Architecture in a Rapidly Evolving Africa," the event reflected on the past, addressed emerging challenges, and explored future directions for architecture in Africa.

In her welcome address, Arc. Mobolaji Adeniyi, FNIA, President of NIA, emphasized the vital role of architecture in driving sustainable development and addressing Africa's socio-economic realities. She highlighted the importance of multidisciplinary collaboration and the need to reimagine the built environment in line with modern trends and community needs.

The commemorative event drew a high-profile audience, including Former President of Nigeria, H.E Dr. Goodluck Ebele Jonathan, GCFR, and Former Vice President, H.E Arc. Namadi Sambo, GCON, both of whom were recognized for their leadership and contributions to the development of Nigeriaâ€™s built environment.

The presence of Nigeria's first female NSE President, was particularly notable and symbolic of the growing synergy among professional bodies in the construction industry. Her participation highlighted the mutual respect and collaboration between NSE and NIA.

NSE Signs Landmark Product Endorsement Deal with COSTECH

The NSE President (right) and the MD/CEO of COSTECH in a handshake after MOU signing

Abuja, May 14, 2025 — In a significant move aimed at fostering local content promotion and technological advancement within the Engineering sector, the Nigerian Society of Engineers (NSE) has signed a Memorandum of Understanding (MoU) with Costech Computers Limited, a wholly indigenous and globally recognized tech solutions provider.

The official signing ceremony took place at the National Engineering Centre (NEC) Headquarters, Abuja, and was presided over by the President of NSE, Engr. Margaret Aina Oguntala, FNSE, who signed on behalf of the Society. The Managing Director/Chief Executive of COSTECH, Mr. Adefemi Aderinola, signed on behalf of his company.

Under the terms of the agreement, NSE has endorsed COSTECH's range of products—spanning computer hardware, software, and electronics—as the preferred choice for its members, the wider Engineering community, and the general public. The endorsement grants COSTECH the right to use the NSE's seal and logo on its products, symbolizing quality and professional approval. In turn, NSE will showcase COSTECH's products and promote them within its network and upcoming events. COSTECH is also expected to reciprocate by supporting NSE's programmes and extending visibility to NSE through its own platforms.

Speaking at the event, NSE President praised COSTECH for its resilience and patience throughout the engagement process, describing the partnership as a "milestone in promoting innovation and indigenous capacity within the engineering ecosystem."

In his remarks, Mr. Adefemi Aderinola expressed gratitude to the NSE for the endorsement opportunity and pledged a robust and mutually beneficial business relationship going forward.

This strategic collaboration further demonstrates NSE's commitment to promoting professional excellence, ethical business practices, and partnerships that strengthen the Engineering profession in Nigeria.

The NSE President (middle), Deputy President (second right), Chairman NSE Endorsement Committee, Engr. Abdul Audu, FNSE (right) and COSTECH Officials.

NSE President Assures NUESA of Commitment to Capacity Development

Abuja, May 23, 2025 — The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has reaffirmed the Society's commitment to building the capacity of Engineering students across the country. She gave this assurance while receiving the President of the Nigerian University Engineering Students' Association (NUESA), Joshua Ojo Idemudian, and his executive team at the National Engineering Centre (NEC), Abuja.

The NSE President, Engr. Margaret Aina Oguntala, FNSE receives a plaque presented by President of NUESA, Joshua Ojo Idemudian

The NSE President described Engineering students as the future of the profession and emphasized that the NSE is leaving no stone unturned in preparing them for professional challenges. She commended the students for proactively engaging with the Society's leadership and encouraged them to connect with NSE Branches in their catchment areas to benefit from student-focused programmes.

Responding to their request for assistance with Industrial Training and NYSC placements, the NSE President disclosed that the Society has already partnered with several Engineering firms and agencies to absorb students for both purposes. She further advised student chapters to maintain strong ties with NSE Branches for seamless coordination.

The President also announced that the Society has reached an agreement to establish a Skills Acquisition Centre, where Engineering graduates can gain practical training in areas such as instrumentation and fabrication, helping bridge the gap between academic theory and industry practice.

The visit concluded on a celebratory note as the NUESA leadership felicitated with the President on her last birthday and presented her with a commemorative plaque in appreciation of her leadership and continued support for Engineering students nationwide.

Group picture

Renaissance Africa Energy Company Reaffirms Commitment to Collaboration with NSE

The NSE President, Engr. Margaret Aina Oguntala, FNSE

Abuja, Nigeria – May 23, 2025, Renaissance Africa Energy Company Limited (RAEC) has reaffirmed its unwavering commitment to continued collaboration with the Nigerian Society of Engineers (NSE), signaling its intention to strengthen partnerships that advance Engineering excellence and national development.

This assurance was delivered by Engr. Olabode Oladoyin, FNSE, Head of Capability at RAEC, during a courtesy visit to the NSE President, Engr. Margaret Aina Oguntala, FNSE, held at the National Engineering Centre (NEC) Headquarters in Abuja.

Speaking on behalf of the company, Engr. Oladoyin formally informed the NSE leadership of the successful transition of Shell Petroleum Development Company (SPDC) into Renaissance Africa Energy Company Limited, following its acquisition by Nigerian stakeholders in the oil and gas sector. He emphasized the new entity's readiness to uphold and expand its long-standing relationship with NSE.

In her response, NSE President congratulated the officials on the successful due diligence and transition process. She expressed delight that RAEC is now a wholly Nigerian-owned company, describing it as a significant opportunity for Nigerian Engineers to demonstrate leadership, technical expertise, and innovation within the energy industry.

The NSE President welcomed RAEC's reaffirmed commitment to collaboration and acknowledged the company's notable support during the 2024 International Engineering Conference and Annual General Meeting, which significantly contributed to its success. She appealed to RAEC to maintain its support toward the upcoming 2025 Engineering Conference scheduled to hold in Ibadan, Oyo State.

She further encouraged RAEC to continue investing in capacity-building initiatives that empower the next generation of Engineering professionals across Nigeria. The meeting concluded with a renewed pledge of mutual collaboration, focused on advancing Engineering excellence, innovation, and national development through strengthened synergy between NSE and RAEC.

Group picture

NSE Calls for Engineering-Driven Solutions to Tackle Petroleum Tanker Explosions in Nigeria

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has emphasized the need for evidence-based strategies and Engineering-driven interventions to mitigate the frequent occurrence of petroleum tanker explosions across the country.

This call was made during her attendance at the opening ceremony of a two-day National Workshop on Petroleum Tanker Explosions in Nigeria, organised by the Nigerian Institution of Safety Engineers (NISafetyE), - A Division of NSE

The workshop, themed "The Problem of Petroleum Tanker Explosion in Nigeria – The Issues, the Challenges, and the Solutions", was held at the National Engineering Centre (NEC), Abuja, on 27th and 28th May, 2025.

The forum brought together safety Engineers, government representatives, emergency management agencies, and key industry players to deliberate on practical and policy-driven approaches to curb the alarming rate of tanker-related incidents. The workshop featured technical sessions and expert panel discussions aimed at generating actionable recommendations for enhanced transport safety and regulatory compliance.

NSE President

The NSE President lauded the leadership of NISafetyE for convening such a timely and relevant dialogue and reaffirmed NSE's commitment to supporting collaborative efforts that promote public safety, infrastructure resilience, and Engineering excellence across Nigeria.

Group picture

International HR Day 2025: NSE President Joins Global Celebration

On May 20, 2025, the Nigerian Society of Engineers (NSE) joined the global HR community in celebrating International HR Day at the NSE Headquarters. The event embraced this year's theme, "HumanifyAI: Leading Change Together," highlighting the critical balance between technological advancement and human-centered workplace practices.

The NSE President, Engr. Margaret Aina Oguntala, alongside the NSE HR team, commemorated the occasion by recognizing the pivotal role HR professionals play in guiding engineering organizations through digital transformation while preserving essential human connections. The celebration emphasized how the NSE is navigating the integration of AI into its operations while maintaining its commitment to employee wellbeing, ethical practices, and inclusive workplace culture.

As technological innovation continues to reshape the engineering sector, the NSE under Engr. Oguntala's leadership remains dedicated to harmonizing these advancements with human-centric values, ensuring that technology enhances rather than replaces the human element that defines the organization's success.

Right: President of NSE, Engr. Margaret Aina Oguntala, FNSE and Deputy President of NSE, Engr. Ali A. Rabiu, FNSE, FAEng, MFR

The NSE President and Deputy President in a group photograph with the HR Team

Zinox Technologies Seeks Strategic ICT Collaboration with Nigerian Society of Engineers

Abuja, May 26, 2025 – In a move aimed at fostering technological advancement and strengthening the synergy between industry and Engineering practice, Zinox Technologies has approached the Nigerian Society of Engineers (NSE) for collaboration in the field of Information and Computer Technology (ICT).

This development was the highlight of a strategic meeting held today at the National Engineering Centre (NEC) Headquarters, Abuja, where the President of NSE, Engr. Margaret Aina Oguntala, FNSE, received the Zinox Technologies team led by its Managing Director, Ms. Kelechi Eze-Okonta.

Left: President of NSE, Engr. Margaret Aina Oguntala, FNSE listens while MD of Zinox Technology, Mrs. Kelechi Eze-Okonta speaks

In her remarks, Eze-Okonta emphasized the alignment of the proposed partnership with the second pillar of NSE's Strategic Agenda—Enhancing Intergovernmental, Industry, and Academia Collaborations. She noted that Zinox Technologies is particularly interested in addressing longstanding ICT challenges in specific sectors and believes that partnering with NSE will provide the needed platform to develop impactful solutions. "We are excited about the opportunity to work with NSE not only to solve technical problems but also to support the growth of future Engineers." She added.

In her response, NSE President reiterated NSE's readiness to build a mutually beneficial relationship with Zinox Technologies. She praised the company for its resilience and achievements in building a reputable Nigerian brand recognized both locally and internationally.

"I commend your commitment to developing indigenous capacity. The platform you've provided has greatly enhanced the competence of Nigerian professionals, putting them on par with their peers across the globe," said the NSE President.

To kick-start the collaboration, NSE President proposed the immediate establishment of a Joint Committee comprising members of the NSE ICT Division and Zinox Technologies. She stressed the importance of taking swift action to translate the discussions into concrete outcomes. The meeting signals a promising beginning for what is expected to be a strategic partnership aimed at advancing ICT capabilities and professional Engineering practice in Nigeria.

Meeting Session

NSE Inaugurates Joint Infrastructure Committee with Zinox Technologies, Signs MoU

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, today Tuesday, June 17, 2025 inaugurated the NSE/Zinox Joint Infrastructure Development Committee at the National Engineering Centre (NEC), Headquarters in Abuja. The historic event also featured the signing of a Memorandum of Understanding (MoU) that defines the structure and operations of the joint committee.

This event follows a meeting held on Monday, May 26, 2025, during which Zinox Technologies Limited expressed interest in partnering with NSE to drive innovation and development in the Information and Communications Technology (ICT) sector. The Zinox delegation was led by its Managing Director, Mrs. Kelechi Eze-Okonta and was received by the NSE President.

Engr. Oguntala *Mrs. Eze-Okonta*

Scope of the Collaboration:

The collaboration, as outlined in the MoU, spans several strategic areas, including:

* Co-development of engineering codes and standards specifically for ICT and telecommunications in Nigeria.
* Support for the Council for the Regulation of Engineering in Nigeria (COREN)'s Engineering Regulation Monitoring (ERM) in ICT-related infrastructure and projects.
* Joint innovation, design and deployment of indigenous hardware and software solutions aligned with Nigeria's developmental priorities in health, agriculture, power, education and security.
* Establishment of a world-class ICT Engineering Centre equipped for research, digital manufacturing, and software incubation.
* Training and capacity building through hackathons, mentorships, internships, bootcamps, and professional development programmmes tailored for Engineers.
* Development of customised ICT systems to enhance NSE's operational efficiency and service delivery.
* Deployment of structured product acquisition schemes enabling NSE staff and members to access Zinox products under flexible financing arrangements.
* Strategic branding opportunities for Zinox at NSE flagship events, including the Annual Engineering Conference and Annual General Meeting (AGM), in accordance with NSE's brand guidelines.

Committee Members

NSE Representatives:

* Engr. Oluwadara Oluwadara, MNSE
* Engr. Felix Akinsola, MNSE
* Engr. Vivien Aliyu, MNSE
* Oladele Kudehinbu (Secretary)

Zinox Representatives:

* Kinsley Asonye
* Moses Edoh
* Benjamin Ohanu
* Simisola Lawal

The President signed the MoU on behalf of the Society, witnessed by the Executive Secretary, Engr. Joshua Egube, FNSE, in the presence of the Deputy President, Engr. Ali A. Rabiu, FNSE, FAEng, MFR. On the side of Zinox Technologies Limited, the Managing Director, Mrs. Kelechi Eze-Okonta signed while Mr. Kingsley Asonye witnessed.

The partnership marks a bold step in uniting the engineering profession and Nigeria's ICT industry to accelerate indigenous technology development and infrastructure growth.

NSE Champions Engineering Leadership at Africa Gas Innovation Summit 2025

...Calls for Innovation, Urgency, and Cross-Sector Collaboration in Africa's Gas Economy

Engr. Oguntala

Abuja, Nigeria – June 18, 2025

Africa's vast natural gas reserves are a vital transition fuel with the potential to drive industrialization, regional integration, and inclusive development, according to Engr. Margaret Aina Oguntala, FNSE, President of the Nigerian Society of Engineers (NSE). She made this known in her keynote goodwill message at the Africa Gas Innovation Summit (AGIS) 2025, where she served as Special Guest of Honour. Speaking on the summit theme—"Building a Resilient Africa Gas Economy through Innovation and Collaboration"—she urged African stakeholders to harness gas resources for sustainable and transformative progress.

The summit, organized by the Society of Petroleum Engineers (SPE) Nigeria Council, brought together policymakers, industry leaders, development partners, and engineering professionals from across the continent. The NSE President commended the organizers for their dedication to advancing meaningful dialogue on energy innovation and for positioning Africa to play a leading role in the global energy transition.

Reaffirming the NSE's position, she emphasized the Society's commitment to home-grown innovation, cross-sector collaboration, and sustainable engineering practices. She praised AGIS 2025's strategic agenda—boosting domestic gas utilization, accelerating regulatory reforms, encouraging ESG alignment, and promoting practical financing mechanisms—describing them as engineering challenges that must be addressed through inclusive, ethical, and scalable solutions.

The President called on governments, academia, industry, and civil society to unite beyond silos and titles, and to act with urgency and shared purpose. "Africa's energy future depends not only on innovation but on collaboration with intention and action with urgency," she stated, as the summit continues to explore how gas can serve as a catalyst for Africa's long-term energy security and economic growth.

NSE Commends Tinubu on Infrastructure Drive, Urges Sustained Momentum and Continued Local Content Inclusion

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has commended the Federal Government for its strategic infrastructure investments, particularly the Lagos-Calabar Coastal Superhighway. Speaking during an interview session at the commissioning of the project's first section at Kilometre 8, Jakande Estate, Lagos, She praised President Bola Ahmed Tinubu, GCFR, for demonstrating visionary leadership in enhancing national connectivity and economic growth through critical projects.

Rght: President of NSE, Engr. Margaret Aina Oguntala, FNSE, and Managing Director of FERMA, Engr. (Dr.) Chukwuemeka Agbasi, FNSE

From right: President of NSE, Engr. Margaret Aina Oguntala, FNSE, being received by the Hon. Minister of Works, Engr. Dave Umahi, FNSE

NSE President emphasized the need to sustain momentum by initiating additional strategic projects across all geopolitical zones, focusing on economic inclusion and regional balance. She advocated for total commitment to local content development, urging the government to meaningfully engage Nigerian professionals, materials, and innovations in project execution to strengthen national capacity and promote self-reliance.

Reaffirming the NSE's readiness to support national development, she said the Society would continue to offer technical expertise and professional guidance to ensure infrastructure projects meet global standards of quality, safety, and sustainability. She also called on stakeholders, including public institutions, private sector players, and development partners, to collaborate in advancing the country's infrastructure goals.

In his remarks, President Tinubu described the Lagos-Calabar Coastal Superhighway as a "crucial artery for trade, tourism, and national integration," adding that infrastructure under his Renewed Hope Agenda will lay the foundation for economic prosperity and national unity. "This project is more than just brick and mortar—it is a pathway to inclusion, cohesion, and opportunity for all Nigerians," he said.

The 30-kilometre first section from Ahmadu Bello Way to Eleko Village is part of a 700-kilometre superhighway spanning nine states. Tinubu also commissioned other key projects, including the Lagos–Ibadan Expressway (Shagamu–Ibadan section), East-West Road (Eleme–Ahoada), Alesi–Ugep Road, and parts of the Enugu–Lokpanta Expressway, alongside new bridges and flagged-off initiatives like the Ibadan–Ife–Akure–Benin Highway and the Nembe–Brass Road, reaffirming his administration's commitment to national transformation through infrastructure.

NSE Reaffirms Commitment to the Success of IFES

Chengdu, China — June 11, 2025

The Nigerian Society of Engineers (NSE) has reaffirmed its unwavering commitment to the success and advancement of the International Federation of Engineering Societies (IFES) under the Belt and Road Initiative.

This affirmation was made by the President and Chairman-in-Council of NSE, Engr. Margaret Aina Oguntala, FNSE, during the closed-door meeting of founding members of IFES, held today at the DoubleTree by Hilton, Chengdu, China.

The high-level meeting brought together leaders of founding Engineering institutions from across the globe and served as an exclusive platform for strategic collaboration. Discussions centred on building an inclusive global framework to promote Engineering innovation, sustainability, infrastructure resilience, and mutual growth within the international Engineering community.

The Nigerian Society of Engineers is proud to be one of the founding members of IFES, a multilateral platform dedicated to strengthening Engineering cooperation across continents. This engagement reflects NSE's expanding international influence and commitment to contributing meaningfully to global Engineering development.

Representative of the NSE President, Engr. Olumayowa Idowu, FNSE

In her statement, NSE President emphasized the need for IFES programs to be sensitive to the developmental context and critical needs of each member country.

"A one-size-fits-all approach may not effectively address the unique realities and challenges faced by different countries. IFES must be intentional in responding to those differences," She noted.

She further reiterated the NSE's dedication to Engineering excellence, international collaboration, and the continuous professional development of Nigerian engineers in alignment with evolving global standards.

The Chairman of the Nigerian Society of Engineers, Abeokuta Branch, and member of the Academy Committee of the Federation of African Engineering Organizations (FAEO), Engr. Olumayowa Idowu, FNSE represented the NSE President at the meeting. He had also represented the Society during the historic 2024 agreement to join IFES at the International Engineering Congress.

The active participation of NSE in IFES underscores its status as a key stakeholder in shaping the future of global engineering, with a clear focus on Africa's contribution to sustainable development and international best practices.

IFES Meeting Session

NSE President Seeks Strategic Support for Marine and Blue Economy Engagements During Visit to Senator Gbenga Daniel

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has sought strategic support for advancing Engineering's role in Nigeria's marine and blue economy sector during a courtesy visit to the Chairman of the Senate Committee on Navy, His Excellency Engr. Otunba Senator Gbenga Daniel, FNSE, FAEng at his residence in Abuja.

Engr. Oguntala *Engr. Sen. Daniel*

During the visit, the NSE President outlined key plans and upcoming engagements aimed at strengthening the Engineering profession and supporting Nigeria's marine and blue economy. At the forefront of the discussions was the forthcoming National Engineering Conference, which she described as a major platform for cross-sectoral dialogue and collaboration.

Recognizing Senator Daniel's influential role in the maritime sector, the President requested his support in mobilizing relevant stakeholders across the marine and blue economy space. "Your strategic position provides a vital channel for us to reach the relevant stakeholders," she noted.

She also expressed appreciation for Senator Daniel's consistent commitment to Engineering excellence, particularly in the industrial development of Ogun State, as well as his legislative contributions, including the sponsorship of life-changing bills.

In his response, Senator Gbenga Daniel congratulated NSE President on her historic and trailblazing leadership as the first female President of the NSE, describing her emergence as a milestone in vision, capacity, and perseverance. He pledged his full support for the upcoming conference and other initiatives of the Society.

Commending the Minister of Works for adopting a hands-off approach that has yielded results, Senator Daniel emphasized the need for other sectors to adopt Engineering-driven strategies. "It's time for everyone to embrace Engineering practices as the engine of national development," he stated.

The visit concluded on a collaborative and optimistic note, with both leaders reaffirming their shared commitment to advancing Engineering innovation and forging partnerships that will drive Nigeria's industrial and technological transformation.

Group photograph

NSE President to Evaluate Youth-Led Entrepreneurial Innovations, Serves as Judge at 2025 Enactus Nigeria National Competition

Abuja, Nigeria – June 2025

Engr. Oguntala

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, will serve as a Final Round Judge at the upcoming 2025 Enactus Nigeria National Competition, scheduled to hold in July 2025 at the Civic Centre, Lagos. Her participation comes as part of a select panel of distinguished business and thought leaders invited by the Enactus Nigeria Board of Directors.

This year's competition marks a special milestone as Enactus Nigeria celebrates 25 years of igniting innovation, inspiring leadership, and empowering the next generation of socially responsible business leaders. The event will feature entrepreneurial action projects from over 30 tertiary institutions across Nigeria, with students showcasing innovative solutions to real-world community challenges.

Engr. Oguntala, the first female President of NSE, is known for her advocacy for innovation, youth empowerment, and sustainable Engineering development. Her role as a judge underscores the NSE's commitment to supporting platforms that encourage ingenuity, entrepreneurship, and social impact among young Nigerians.

Winning teams will be assessed based on the sustainability, innovation, and measurable impact of their community projects. The top-performing team will be crowned Enactus Nigeria National Champion and will go on to represent Nigeria at the Enactus World Cup 2025, slated for September 26–28 in Bangkok, Thailand.

Enactus, a global nonprofit, connects students, academics, and business leaders committed to using entrepreneurial action to transform lives and communities. The national competition provides a unique platform for engaging industry leaders and inspiring future changemakers to create scalable, socially driven business solutions.

NSE Signs Consensus on Engineering Capacity Building for the Belt and Road at Chengdu Forum

Chengdu, China — June 11, 2025

The Nigerian Society of Engineers (NSE) today joined 32 other engineering organizations and professional bodies from across the globe to sign the Consensus on Engineering Capacity Building for the Belt and Road, during the opening session of the Belt and Road Forum on Engineering Capacity. The event was held at the Tianfu International Convention Centre, Chengdu, Sichuan Province, China, as part of the ongoing Belt and Road Conference on Science and Technology Exchange (BRST).

This year's forum, themed "Pioneering Engineering Innovation and Co-construction of Engineering Capacity", is a vital part of the broader BRST framework. It focuses on multilateral engineering collaboration, sustainable development, and technical innovation among Belt and Road countries.

The Consensus, co-initiated by 33 global engineering organizations, represents a unified commitment to achieving the United Nations Sustainable Development Goals (SDGs) through strategic cooperation, shared knowledge, and harmonized engineering practices.

Engr. Margaret Aina Oguntala, FNSE, President of the NSE, expressed pride in Nigeria's inclusion in the initiative and reaffirmed the Society's commitment to enhancing engineering capacity across Africa.

Represented at the forum by Engr. Olumayowa Ayodeji Idowu, FNSE, the President stated "This Consensus signals a powerful moment for Africa and a renewed commitment to empower engineers to deliver sustainable solutions. The Nigerian Society of Engineers is proud to be part of this global engineering renaissance."

The agreement outlines six core areas of collaboration which includes Engineering Education & Talent Development, Mutually Recognized Standards & Competency Frameworks, Continuing Professional Development (CPD), Harmonization and Internationalization of Engineering Standards, Engineering Ethics & Social Responsibility, and Global Innovation Exchange & Application of Scientific Achievements

The NSE's participation underscores its continued drive to position Nigerian Engineers on the global stage and contribute meaningfully to infrastructure and capacity development within and beyond Africa.

NSE Unveils Members' App, Federal Government Commends Digital Innovation Drive

Abuja, June 19, 2025 – In a landmark move to boost digital transformation and enhance member engagement, the Nigerian Society of Engineers (NSE) on Thursday 19th June, 2025 launched its Members' App at the National Engineering Centre, Abuja. The innovation, spearheaded by NSE President Engr. Margaret Aina Oguntala, FNSE, is aimed at improving service delivery, eliminating operational bottlenecks, and providing Engineers with seamless access to essential professional services.


Engr. Oguntala

Engr. Abdullahi

Speaking at the launch, NSE President described the app as a strategic tool aligned with the Society's vision of empowering Engineers and positioning them as critical players in national development. She noted that the app is designed to be user-friendly, accessible on the Play Stores, and capable of resolving long-standing communication and accessibility challenges between members and the NSE Headquarters.

A key feature of the app, according to the President, is its ability to eliminate the need for physical visits to the NSE Secretariat, thereby reducing travel risks and costs for members across the country. "At a time of rising insecurity and economic constraints, enabling remote access to services is both timely and vital," she said.

Representing the Federal Government, the Director General of the National Information Technology Development Agency (NITDA), Mr. Kashifu Inuwa Abdullahi, who was ably represented by a Director, Engr. Kaka Salisu, FNSE, commended NSE for the innovation. Describing the initiative as a hallmark of local content and digital leadership, he emphasized that it aligns with NITDA's digital transformation agenda. He assured the Society of NITDA's commitment to closer collaboration with professional bodies in building a robust digital ecosystem.

The launch signals NSE's readiness to embrace digital solutions to advance Engineering practice in Nigeria. With the government's endorsement and the Society's vision, the Members' App is expected to set a new standard for professional engagement and technological adoption among Engineering bodies nationwide.

Group photograph

NSE Secretariat Staff Celebrate President on Her Birthday

President of COREN, Engr. Prof. S.Z. Abubakar, FNSE, FAEng making a presentation to the President of NSE, Engr. Margaret Aina Oguntala, FNSe on behalf of NSE Staff

Members of staff of the Nigerian Society of Engineers (NSE) Headquarters came together today, Wednesday, April 23, 2025 to commemorate the birthday anniversary of the President, Engr. Margaret Aina Oguntala, FNSE, with heartfelt gestures of celebration and joy.

During the brief but warm ceremony, the Deputy Director of Human Resources, Mrs. Adeola Akanni, expressed the staff's gratitude for the President's unwavering love and support. She described the souvenirs presented as tokens of appreciation, acknowledging Engr. Oguntala's exemplary leadership and the affectionate guidance she extends to all staff members, inspiring them to reach their fullest potential.

The presentation of gifts was graciously made on behalf of the staff by the President of the Council for the Regulation of Engineering in Nigeria (COREN), Engr. Prof. Sadiq Zubair Abubakar, FNSE, FAEng. In response, the NSe President thanked the entire Secretariat Staff for their kind gesture and warm wishes.

Earlier, on Tuesday, April 15, 2025, which was the actual birth date of Madam President, the Secretariat staff had marked the occasion symbolically, as the President was on vacation. In a show of unity and admiration, the staff made videos and connected with the President via Zoom, where they showered her with prayers and wished her continued success in the years ahead.

The NSE President and the COREN President in a group photograph with Members of the NSE Secretariat Staff

NSE President Highlights Role of Professional Bodies in Human Capacity Development for the Future of Energy

NSE President Highlights Role of Professional Bodies in Human Capacity Development for the Future of Energy

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has emphasized the critical role of professional bodies in driving human capacity development for the evolving energy sector. She made this known while participating as a distinguished panelist at the NOG Energy Week 2025, one of Africa's premier energy conferences, held today, Monday, 30th June 2025.

During the Strategic Panel Session themed "Human Capacity Development for the Future of Energy," NSE President joined other notable industry leaders to discuss effective strategies for workforce development amidst rapidly evolving energy technologies and operational demands. She highlighted the pressing disconnect between academic training and industry needs, noting that many Engineering graduates lack practical, hands-on experience, and there is a growing shortage of talent in areas such as data analytics, AI-driven asset management, and green energy technologies.

The President underscored the need for competency-based training frameworks that integrate internships, project-based learning, and continuous professional development, not only for new entrants but also for mid-career professionals requiring reskilling to remain relevant in the industry. She further emphasized that professional bodies like the NSE plays a pivotal role in bridging the gap between academia, industry, and policymakers by ensuring ethical standards, driving structured CPD programmes, and supporting mentorship and networking platforms that foster knowledge transfer and inclusivity within the engineering workforce.

The participation of the NSE President reflects the Society's ongoing commitment to championing Engineering excellence and promoting impactful collaboration within Nigeria's energy and engineering ecosystem.

NSE CPC Visits Ibadan Ahead of 2025 International Conference

The 2025 Conference Planning Committee (CPC) of the Nigerian Society of Engineers (NSE), led by its Chairman, Engr. Mutiu Omoniyi Odesanya, FNSE, together with the Local Organising Committee (LOC) Chairman, Engr. Olawale Lagunju, FNSE, mni, paid a strategic visit to Ibadan yesterday, 1st July 2025, ahead of the 2025 NSE International Conference scheduled to hold from December 1–5, 2025, at the International Conference Centre, University of Ibadan.

The conference, themed "Engineering Innovation for a Sustainable Blue Economy," is set to attract Engineers, policymakers, academia, and industry leaders across Nigeria and beyond to discuss critical solutions for advancing sustainability within Nigeria's Engineering ecosystem.

The CPC was warmly received by the Vice Chancellor of the University of Ibadan, Professor Kayode Adebowale, ably represented by the Deputy Vice Chancellor (Administration), Professor Peter Olamakinde Olapegba, alongside the Deputy Vice Chancellor (Academics), Professor Aderonke Bayeroju, the Deputy Vice Chancellor (Research, Innovation, and Strategic Partnerships), Professor Oluyomi Bamgbose, the University Registrar, the University Librarian, and other top management staff of the University.

During the visit, the Committee inspected key facilities, including the International Conference Centre, the University Mini-Stadium (which will host the closing ceremony of the National Engineering Games), and several hotels in Ibadan for accommodation and logistics arrangements to ensure a seamless and impactful conference experience for delegates.

In addition, the Committee also held meetings with various stakeholders in Ibadan to foster collaboration and ensure a successful hosting of the 2025 NSE International Conference.

The visit underscored the NSE's commitment to delivering a world-class conference that aligns with its vision of advancing Engineering excellence while fostering innovation to drive sustainable national development.

NSE Executive Secretary: Joshua Egube Bows Out, Mu'azu Takes Over

The tenure of the erstwhile Executive Secretary of the Nigerian Society of Engineers (NSE), Engr. Joshua Egube, FNSE, officially ended on Monday, June 30, 2025 as he handed over to the incoming Executive Secretary, Engr. Abubakar Halilu Mu'azu, FNSE, at a brief ceremony held at the National Engineering Centre, Abuja.

The handing over marks the close of Engr. Egube's impactful tenure, during which he provided stable administrative leadership, strengthened the secretariat's operational efficiency and supported the Society's vision for Engineering excellence.

The new Executive Secretary, Engr. Abubakar Halilu Mu'azu, FNSE, officially assumed duties on Tuesday, July 1, 2025 for a three-year tenure. He brings with him a wealth of professional experience, commitment to the Engineering profession and a clear vision to continue building on the progress made by his predecessor.

Middle: President of NSE, Engr. Margaret Aina Oguntala, FNSE flanked by Deputy President of NSE, Engr. Ali A. Rabiu, FNSE, FAEng, MFR (left) and the Immediate Past Executive Secretary, Engr. Joshua Egube, FNSE (right)

Speaking during the handing over ceremony, Engr. Egube expressed his gratitude to the President, Council and staff of the NSE for the cooperation he received throughout his tenure, while urging the team to extend the same support to the incoming Executive Secretary to ensure the continued advancement of the Society's objectives.

In his remarks, Engr. Mu'azu expressed appreciation for the opportunity to serve and pledged to work diligently with the leadership of the NSE, staff and stakeholders to sustain and enhance the Society's administrative excellence and commitment to advancing Engineering practice in Nigeria.

"Africa's Energy Transition Requires Engineers Who Can Lead with Innovation and Integrity," Says NSE President

...Turns Sod for New NSE Ibadan Branch Office Complex

The President of the Nigerian Society of Engineers (NSE), Engr. Margaret Aina Oguntala, FNSE, has stated that "Africa's energy transition requires engineers who can lead with innovation and integrity," underscoring the critical role of Engineers in advancing sustainable energy solutions across the continent. She made this known today, 2nd July 2025, while attending the 8th Ifedayo Akintunde Annual Lecture held at Abiola Ajimobi Technical University, Ibadan, themed "Empowering Africa's Energy Transition."

Middle: President of NSE, Engr. Margaret Aina Oguntala, FNSE, flanked by Past President of NSE, Engr. Ifedayo Akintunde, FNSE (left) and Past Vice President of NSE, Engr. Valerie Agberagba, FNSE (right)

The event, organised by the NSE Oluyole Branch, featured Engr. Francis Agoha, FNSE, MD/CEO of the Ibadan Electricity Distribution Company (IBEDC), as the keynote speaker. He shared insights on strategies for achieving a sustainable and affordable energy transition in Africa. The guest speaker, Professor Olumuyiwa Oyinlola, further enriched the discourse with academic perspectives on policy frameworks and innovative technologies essential for Africa's energy future.

In her remarks, NSE President celebrated the enduring legacy of Engr. Ifedayo Akintunde, FNSE, FAEng, past President of the NSE (1987–1988) and former Vice President of the World Federation of Engineering Organizations (WFEO), acknowledging his remarkable contributions to Engineering in Nigeria and globally and describing him as a model of ethical leadership and professional excellence.

Following the lecture, the NSE President attended the turning of the sod ceremony for the new NSE Ibadan Branch Office Complex, where she urged that the facility be fully utilised to advance the Society's objectives of fostering innovation, collaboration, and professional development while serving as a true centre of engineering excellence.

She encouraged the Branch leadership to uphold the legacies of past administrations while prioritising mentoring young Engineers, who represent the future of the profession, stressing that continuous investment in their development is essential for sustaining Engineering excellence and driving Nigeria's growth.

The event underscored the NSE's ongoing commitment to championing engineering development, promoting sustainable energy practices, and nurturing future leaders to support national and continental aspirations.

Group picture

Training, Installation and Commissioning of 6.3KVa Solar System at the NSE Ikeja Branch Secretariat

Powering the Future: Secretariat Goes Solar with 6.3KVA Clean Energy Installation

As part of our ongoing commitment to sustainability, innovation, and professional development, we are proud of the successful installation of a 6.3KVA Solar Power System at the Secretariat.

This marks a significant step toward addressing our energy needs through clean and renewable means, while also fostering knowledge transfer among our members.

The new solar installation now powers both the Administrative Office Section and the Olu Awoyinfa Multipurpose Hall, ensuring continuous operation even during national grid outages.

Beyond the immediate energy benefits, this project also served as a practical training and empowerment initiative for interested young engineers and members. The 3 Days training was held at the Branch Secretariat on April 19, 26 and May 3, 2025 at the NSE Ikeja Branch Secretariat, Ralph Alabi engineering complex at Oba Ogunji, Ogba via Pen Cinema Agege Lagos.

The participants were actively involved in the process—gaining firsthand experience in solar system design, installation, and maintenance.

Driving Sustainability and Cost Efficiency

This strategic move delivers measurable impacts on multiple fronts:

- Reduces our monthly energy costs
- Minimizes reliance on the national grid and fuel-powered generators
- Supports our green energy and environmental sustainability initiatives
- Helps lower our overall carbon emissions

By embracing solar power, we are directly contributing to a cleaner environment and demonstrating how engineering solutions can drive sustainable change within institutions and communities.

The NSE Ikeja Branch Culture of Action and Impact

The solar system was commissioned on May 8, 2025. This initiative is a clear reflection of our branch's long-standing ethos: engineering with purpose. It showcases how infrastructure can be both functional and forward-thinking, while reinforcing our commitment to knowledge-sharing and environmental responsibility. We express our deep appreciation to our donors.

As we continue to adopt more sustainable practices, we invite other members and all engineers to be active participants in their various Branches and engineering disciplines. Together, we continue to "build a viable engineering culture."

Training, Installation and Commissioning of 6.3KVa Solar System at the Branch Secretariat

Commissioning of 6.3KVa Solar System at the Branch Secretariat

2025 Business Luncheon

Driving Industrial Transformation: NSE Ikeja Hosts 2025 Annual Business Luncheon

The 2025 Annual Business Luncheon of the Nigerian Society of Engineers (NSE), Ikeja Branch, held on May 6, 2025 at the NSE Ikeja Branch Secretariat under the theme ***"Nigeria's Industrial Transformation through Experiential Learning and Industry Partnership,"*** brought together key voices in engineering, academia, and industry to chart a forward-thinking agenda for national development. The lecture was delivered by Mrs. Olubukola Adubi, CEO, Miccom Cables & Wires Limited and President of the Cable Manufacturers Association of Nigeria (CAMAN).

In her opening remarks, the Chairman of NSE Ikeja Branch, Engr. Nimot Muili, FNSE, emphasized the urgency of aligning engineering education with the realities of Nigeria's industrial needs. She noted that transformation must go beyond blueprints and physical infrastructure to include **people, processes, and partnerships.**

"Today's rapidly evolving industrial landscape demands more than theoretical knowledge—it calls for practical experience, structured mentorship, and strong synergy between academia and industry," she stated.

Bridging the Gap Between 'Town and Gown'

Over the past year, NSE Ikeja Branch has implemented several strategic initiatives to close the gap between education and industry. These include:

- Structured industrial tours to factories, power plants, and construction sites
- Career readiness workshops and mock interviews
- Entrepreneurship and innovation training sessions
- Internship facilitation and job-shadowing schemes

These programs have provided young engineers with real-world exposure and equipped them with the soft and technical skills necessary to thrive in today's workforce.

Launch of the NSE Ikeja Mentorship Logbooks

A key highlight of the event was the official launch of the NSE Ikeja Mentorship Log books, under the NSE Ikeja Branch Adigun Arewa Mentorship Scheme (NIBAAMS). This tool, carefully designed for both mentors and mentees, is a major step forward in professional development.

The logbook serves as:

- A structured framework for tracking skill transfer and learning outcomes
- A means to ensure accountability and reinforce professional ethics
- A platform to promote work readiness and expose mentees to in-demand industry competencies

This initiative reinforces the branch's commitment to purposeful, measurable mentorship as a critical lever for national development.

Building for the Future

The luncheon also spotlighted the Branch's resolve to upgrade its training centre into a Centre of Excellence for hands-on learning, further cementing its role as a hub for talent development. The Chairman reaffirmed the Branch's openness to industry partnerships that support practical learning, innovation, and sustainable engineering practice.

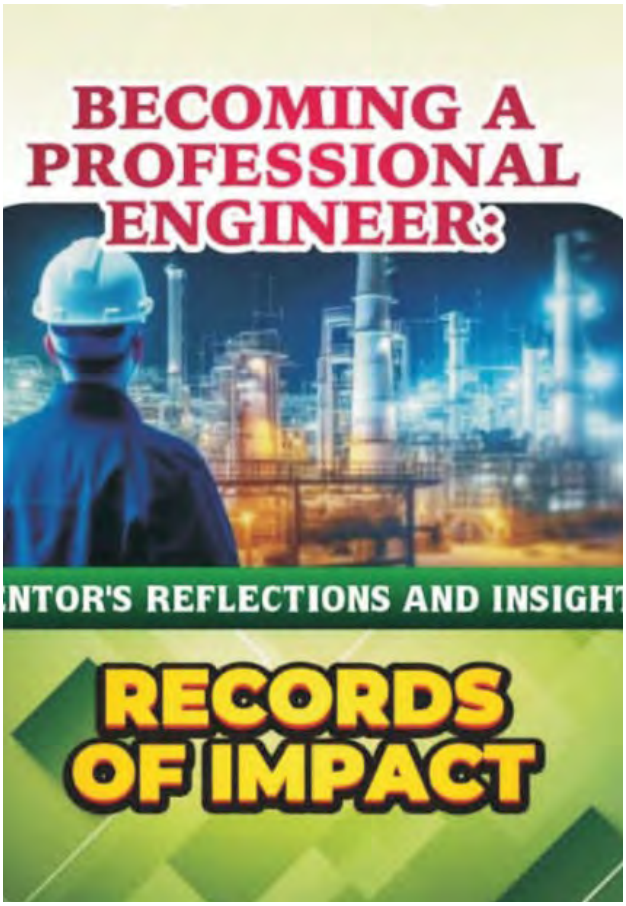
A Call to Action

As the event featured robust engagements with esteemed guest speakers and panelists, Engr. Nimot Muili,FNSE urged all participants to reflect deeply on their roles as change agents.

"Let us not leave this luncheon with just ideas—let us leave with resolve," she concluded.

The 2025 Business Luncheon served not only as a testament to progress but also as a catalyst for engineers and industry leaders to envision a transformed industrial future for Nigeria—fueled by hands-on learning, strategic partnerships, and innovation.

Panellist - L- r …Director, Tyiliumi Nigeria, Engr Folorunsho Ogunleye,FNSE; Panel Moderator, Rasheedat Edidi-Balogun; Dean Faculty of Engineering, University of Lagos, Engr, Prof Samson Adeosun; Guest Speaker, CEO, Miccom Cables & Wires Limited Mrs. Olubukola Adubi; Chairman Nigerian Society of Engineers (NSE) Ikeja Branch, Engr Nimot Muili,FNSE; Fellow (Nimeche) Engr Gainiyu Owolabi,FNSE; Dean, School of Engineering, Yaba College of Technology, Engr Isaac Ajiboshin; former President (APWEN) Engr Idiat Amusu,FNSE


BECOMING A
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JOURNAL

2-Day Hybrid Intensive CNG Training

In a bold step towards promoting environmental sustainability and technical capacity development, the Nigerian Society of Engineers (NSE), Ikeja Branch held a 2-day hybrid intensive training on Compressed Natural Gas (CNG) from April 11–12, 2025, at the NSE Ikeja Secretariat.

The training was facilitated by Engr. Dr. Adewale Ikotun, FNSE, Chief Executive Officer of Automation Autogas Company, in collaboration with Ms Rebecca Kehinde, Founder, AutoBeccs Innovative Solutions, and was convened under the leadership of the Branch Chairman, Engr. Nimot Muili, FNSE.

This initiative aligns with the Federal Government's Presidential CNG Initiative (PCNGi)—a key component of Nigeria's energy transition plan, which seeks to replace high-emission fossil fuels with cleaner, affordable alternatives like CNG, particularly in the transport sector.

PCNGi includes incentives such as free CNG conversion for commercial buses, and forms part of Nigeria's commitment to reducing carbon emissions and achieving net-zero targets.

The training also reinforces the Nigerian Society of Engineers' commitment to championing green engineering practices, preparing professionals for emerging energy markets, and supporting national development objectives through skills-based interventions.

The training highlights

Participants engaged in hands-on sessions and expert-led discussions, covering:

- The Current and Future Outlook of CNG in Nigeria
- CNG Chemistry and Fundamentals
- The Role of PCNGi and Policy Support
- Opportunities in the CNG Supply Chain
- Reverse Engineering of CNG Kits—focusing on collaboration between academia and industry

This hybrid format enabled participation from a wider audience across regions, and all attendees were awarded certificates of participation in recognition of their dedication to professional growth and sustainability.

In her closing remarks, Engr. Nimot Muili, FNSE, expressed satisfaction with the turnout and the positive impact the training had on participants. She emphasized the critical role engineers play in Nigeria's shift from fossil fuels to clean energy and charged participants to be ambassadors of the clean energy movement.

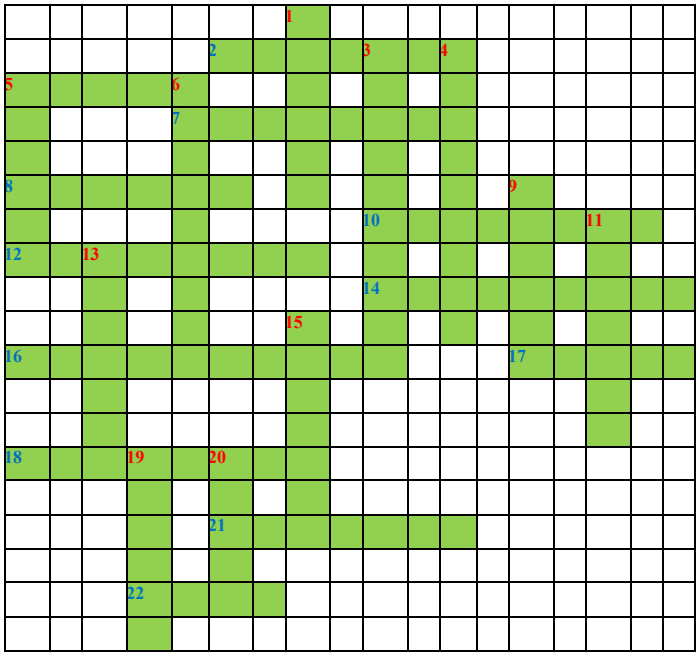
"This training is not just about acquiring skills—it's about positioning you as leaders in the ongoing energy transition. We are confident that each of you will drive this agenda forward in your communities and workplaces," she said.

She further reiterated the Branch's commitment to establishing platforms that foster innovation, collaboration, and readiness for a sustainable energy future.

The CNG training exemplifies NSE Ikeja Branch's proactive efforts in shaping engineers who are environmentally responsible and future-ready. It is a tangible expression of the Branch's theme of "building a viable engineering culture"—one that is rooted in impact, relevance, and resilience.

Through such impactful programs, the Branch continues to demonstrate leadership in supporting Nigeria's transition to cleaner, more sustainable energy sources—one engineer at a time.

Engineering Puzzle July 2025



S/N	Across	S/N	Down
2	Bread and raise (animals)	1	The condition of being protected from or unlikely to cause danger, risk, or injury.
5	A horizontal plane or line with respect to the distance above or below a given point.	3	process by which a domain, a product, or a service is renewed and brought up to date by applying new processes, introducing new techniques, or establishing successful ideas to create new value.
7	A global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols	4	A coming together of people in a group (as for social, religious, or political purposes) :
8	An unscrewed aircraft or vessel guided by remote control or onboard computers: such as a small remotely operated rotorcraft usually with a mounted camera.	5	A vertical or inclined set of rungs or steps commonly used for climbing or descending.
10	Transported by air	6	Farm animals, with the exception of poultry
12	A sub-domain of engineering and science that includes mechanical engineering, electrical engineering, computer science, and others.	9	Vacuum cleaner
14	A person who invents, especially one who devises some new process, appliance, machine, or article; one who makes inventions.	11	Existing in or derived from nature
16	A decentralized, distributed and public digital ledger that is used to record transactions across many computers.	13	A heated house for chicks or piglet.
17	To run again	15	A large farm, especially in North America or Australia, where cattle or other animals are bred.
18	A person who owns or manages a farm	19	Animal dung used for fertilizer land
21	A period devoted to a particular activity.	20	A vertical section between the treads of a staircase.
22	Not occurring very often.		

DR. L.A IKPEA
Chairman/CEO

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2025 INTERNATIONAL ENGINEERING CONFERENCE, EXHIBITION AND ANNUAL GENERAL MEETING

IBADAN 2025



Theme

ENGINEERING INNOVATION FOR A SUSTAINABLE BLUE ECONOMY

DATE: MONDAY 1ST - FRIDAY 5TH DECEMBER, 2025
VENUE: THE INTERNATIONAL CONFERENCE CENTRE, UNIVERSITY OF IBADAN, OYO STATE.

CONFERENCE FEES:

EARLY BIRD
1ST FEB. - 31ST AUG. 2025

Fellow	N120,000
Delegate	N75,000
Spouse	N25,000
Graduate / Student	N20,000
Virtual Attendee	N60,000
International Delegate	$500

LATE REGISTRATION
Sept. 1, - Nov. 23, 2025

Fellow	N135,000
Delegate	N85,000
Spouse	N30,000
Graduate / Student	N25,000
Virtual Attendee	N70,000
International Delegate	$500

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