This is the story of the Association of Consulting Engineers Nigeria ACEN and its efforts to contribute to the development of Nigeria. It is intended to present the association's history as well as stimulate valuable perspectives, whilst taking the long term view of development

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WATER
ENVIRONMENT
HOUSING

ENGINEERING IS DEVELOPMENT

TOWARDS A NEW ROLE FOR CONSULTANCY IN NATION BUILDING

HEALTH
TRANSPORT
EDUCATION
ENERGY
MANUFACTURING

BAYO ADEOLA

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ACKNOWLEDGEMENTS


Edet Amana


Il Ezebuiro


FA Oseni


Il Etteh

The initiative to document the history of the Association of Consulting Engineers Nigeria, ACEN, was taken in 2005 by the then President, Engr. Edet Amana, and it is to him that the first acknowledgement is due. He invited several people to write chapters for the book then tagged 25 Years of ACEN. Those who responded include Past Presidents F. A. O. Phillips and V. O. Oyefodunrin who gave glimpses of events at the formation of ACEN; and Engr. F. A. Oseni, Engr. I. I. Etteh and Prof. I. I. Ezebuiro who wrote elaborately on the history of engineering in Nigeria. At that time, I contributed the chapter on International Relations. These materials constituted the first draft of this book. Both Engrs. Phillips and Oyefodunrin have since passed on. May the Almighty God grant them eternal rest. I was able to continue consultation with both Engr. Oseni and Prof. Ezebuiro, who continued to show interest and commitment to the project. The contributions of these gentlemen are greatly appreciated.


Bayo Adeola

In order to have in-depth information on several aspects of the history of consulting engineering in Nigeria, I interviewed several people. I met with Alhaji L. O. Okunnu, the Commissioner for Works and Housing from 1967 to 1974 and obtained insights into the formation of COREN and engineering developments in the period. I interviewed Engrs Adenrele Adejumo, T. O. A. Bamgbopa, F. A. Shonubi and Iyiola Omisore, all signatories to the original articles and memorandum of the association, who gave insights into the formation of ACEN in the seventies. I also interviewed Engr. Mrs. J. O. Maduka, the foremost woman in consulting engineering in Nigeria. Engr. Lanre Oyenekan, a former Honorary Secretary in the 1980s gave insights into events in the eighties. Another former Honorary Secretary, Engr Segun Doherty, made his files available for review. Engr. Yemi Songonuga provided information on the formation of ACEN Insurance Company PLC, the managing director for much of ACENICO's existence, Mr. E. A. Oyetoyan, provided information on the early developments of the company, and the last managing director of the company, Mr. Tunde Oshadiya provided information on its last years. ACEN Administrative Secretary, Kola Idowu, and the secretariat support staff made the files in the secretariat available. Engrs. Nurudeen Rafindadi and Suleiman Adamu provided information on Afri-Project Consortium and the Petroleum Trust Fund, PTF. Peter Boswell, the General Manager of FIDIC provided file documents from FIDIC archive in support of the book. Engr. S. A. Alaka granted me an interview and gave information on reclamation works in Lagos in the sixties. I thank all these people for their support and encouragement.

ACEN former Executive Secretary (2007-2008) and Honorary Secretary (2009), Engr. Bade Oke, and the current Executive Secretary, Mr Tunde Amode, reviewed the draft scripts as they were being written and gave support and encouragements. Past presidents of ACEN, Engrs. Kunle Folayan, Segun Adesina, Lanre Sagaya, Edet Amana and Mayen Adetiba were also given the drafts to review. Engr. Kunle Folayan did a detailed review of the whole book while others gave useful feedback. The final proof-reading was led by two professionals, Mrs. Taiwo Owoeye and Mrs Aduke Gomez, and supported by several others. The inputs of these reviewers are greatly appreciated.

Two people based in the United Kingdom worked with me, for the second time on this type of project, and together we are becoming a good team. Angela Charlemagne was the graphic designer who designed the cover, introduction pages and page layout of the book. Ayo Alaka of OsanNimu 3D Branding and Packaging Design served as the co-project manager for the production. In this role, he reviewed in details, every chapter of the book, researched and reviewed every photograph and graphic layout and gave insightful comments and supported the organisation of the printing of the book. I thank them both for their support.

My appreciation goes to the entire membership of ACEN, about and for whom the story has been primarily written. Everybody I discussed the writing of the book with was very supportive and appreciative of the effort. My appreciation also goes to John Boyd, FIDIC president from 2007 to 2009, who agreed to provide a preface to the book and had the ordeal of having to read and review an uncompleted draft. He went through this and not only provided critical feedback, but also wrote a complementary preface which I am not sure the book merits.

I thank my family, particularly, my wife Adebowale Adeola, and my children Adegboygea, Adedoyin, Adebola, Omotayo and Olaoluwa for enduring my passion for work and not enough attention to family matters.

As usual with works of this nature, there are others, professional colleagues, friends, business associates, and the society at large, who directly or


Bade Oke


Tunde Amode


Ayo Alaka


Angela Charlemagne

indirectly, had inputs into this work who definitely have been left out. My appreciation goes to all of them. The contributions of several people not withstanding, the responsibility for this book remains mine.

To you our readers, we hope you find this book useful.

Finally, all praises and thanks go to the Almighty Allah for his grace and mercies.

Bayo Adeola,
Lagos, August 11 2009

Preface By
Engr. Dr. E. J. Amana,
ACEN President 2004-2005

Despite its widely acknowledged recognition as the most important profession for the technological development and growth of any nation, the engineering profession has remained one of the least understood and appreciated professions in Nigeria. This is particularly alarming given the fact that there is no single socio-economic development programme for the use and convenience of man that does not have some engineering involvement. In the particular circumstance of Nigeria and indeed most developing nations where an estimated 80% of all capital expenditure involves major engineering inputs, the pivotal role and significance of engineering development as the most important index of development cannot be over emphasized.

It can be said that "engineering is development". Those governments that have come to this realisation have made the transition from under-developed to developed societies in relatively short time; those who have not remain in poverty and misery"

The Association of Consulting Engineers Nigeria (ACEN) founded in 1971, some 38 years ago, has been at the forefront of engineering development in our country. Its membership comprises firms of highly trained engineers and other professionals who practice their profession by giving independent advice to private and public sector clients and carry out the planning, design, contract administration and management of clients' projects. ACEN is the platform for the development and practice of Consulting Engineering in Nigeria. In collaboration with the Council for the Regulation of Engineering in Nigeria (COREN), the Nigerian Society of Engineers (NSE) and in affiliation with the Federation Internationale Des' Ingenieurs Couseil (FIDIC) it ensures the maintenance of professional standards and ethics and "international best practice" in the provision of consulting engineering services in Nigeria.

It is a well known fact that those who fail to learn lessons from events of the past consign themselves hostage to events of the present and future. This fact underscores the great importance of history in all areas of human endeavour. This book initially envisaged as a history of ACEN at 25, has gone far beyond that initial scope. It is a compendium of facts, figures, details and discussions on how lack of appreciation of the pivotal role of engineering development to economic development has for a long time consigned Nigeria to the rank of under-developed nations.

In this volume, Engr. Bayo Adeola, President of ACEN (2008–2009) has brought

his brilliant engineering mind to focus on issues of our national development. By assiduously documenting and analyzing the presence and absence of organized and sustained engineering inputs to our national development programmes, he has shown that our national development efforts have failed to produce desired results because we have not as a people come to the realisation of the fact that engineering must be enthroned in our national consciousness for our attempts to develop our physical infrastructure, grow our agricultural and industrial productions and maintain our environment in a sustainable basis to succeed. So far, our national development efforts have shown no clear strategy for engineering development and no appreciation of the pivotal role of such strategy to the success of our development effort.

This book is coming at a time Nigeria is working on national transformation policies – the Vision 20-20-20 and Re-branding Nigeria programmes. Through Vision 20-20-20, Nigeria hopes to leap-frog her economy to be one of the largest 20 economies in the world by year 2020. One of the strategies which must be embedded in this vision is the enthronement of engineering development as the most important critical success factor of the vision. Chapter 15 of this book, "Engineering Development" clearly sets out how this can be achieved.

The principle of sacrifice for things we want in life is well established spiritually and physically. As a nation, the sacrifice we must make to have sustainable development is massive investment in the training, retraining and effective use of indigenous engineering manpower. Chapter 13, "Engineering in National Development" lists our past and present postures regarding the importance of engineering in our development programmes. Massive political re-orientation is needed to change some of these postures.

The Re-branding Nigeria Project, in addition to focusing on the external perception of Nigeria and Nigerians, must also look inwards and focus on changing national stereotypes which do not enhance sustainable national development. Let the status of engineers and technologists, the drivers of national economic development be appreciated, enhanced and entrenched in the national ethos. Such re-orientation will reverse the present trend in which our best minds no longer want to go into or stay in engineering. The re-branding process will be incomplete if one of its major planks is not increased productivity of every Nigerian. Engineering is the lead provider of the means of production. That role and responsibility must be recognized, entrenched and appreciated by putting Engineers in political positions in which by virtue of their professional expertise and commitment they can ensure the role of engineering development as driver of national development.

ACEN's role in the engineering development of our nation is entrenched in the fact that it is the reservoir of independent highly skilled engineering manpower committed to providing state of the art consultancy services to their clients. Their work is a knowledge-based and knowledge driven. In the information age knowledge is power. Our nation's primary assets will increasingly be the skills and insights of our citizens who live and work and add value to our national economy. But Nigeria is at the moment a net exporter of skilled manpower because there is no conducive environment to utilize the manpower at home. It does not make sense for Nigeria to export trained manpower. Rather we should export the products and services that our trained manpower produces.

The Re-branding Nigeria Project must change our focus from being an import oriented to being an export oriented nation. Nigeria can largely if not completely achieve her goals set out in the Vision 20-20-20 and the Re-branding Nigeria Projects. To do so she must embark on a major reform programmes outlined in the last chapter of this book. We must not underestimate the enormous political will required to bring about change from the status-quo; but we should never forget that "where there is a will, there is a way".

I congratulate Engr. Bayo Adeola FNSE, for this book which is a veritable resource base, not only for information on engineering development in our country but also for the most important ideas required for national development. This book is a must read for all students and practitioners of engineering and policy makers in Nigeria who would like to know how the presence or absence of engineering inputs have impacted our national developmental programmes in the past. It has gone beyond being a history book; it is a "Clarion Call for Reform" needed for sustainable national development.

I am delighted and highly honoured to give the Foreword to this great treatise on Engineering and Development. I wish ACEN and Nigeria Consulting Engineering industry sustainable healthy development as it marks 30 years of its existence.

Engr. Dr. Edet James Amana, FNSE, FAEng, OON
Past President, ACEN (2004-2005)

Preface by
Dr. John M. Boyd
President FIDIC 2007-2009

In its low key, matter of fact style this book chronicles the development of the engineering consulting industry in Nigeria and is an important record of the history of that industry. In a more fundamental way however, it also tells a story of resilience in the face of difficult circumstances and growth in a profession and in an industry that is an essential prerequisite to economic development. In that context I would recommend it to anyone who needs to understand the particular circumstances of a developing country – any developing country. While the events it describes are specific to Nigeria, the effects of changing political and economic circumstances are not, and in fact are all too common in much of the developing world.
The book ties politics, economic development, and engineering together in a way that shows how political changes have defined and often frustrated the opportunities for engineers to develop the infrastructure and facilities that countries need for successful economic growth. In this manner it defines the connections between the three and makes its case that engineering and development are synonymous.

I first met the author at a FIDIC conference in which he presented a case for improving the effectiveness of development bank aid in Africa and I was both educated and impressed by his passion. Subsequently we both had the opportunity to serve on the FIDIC Executive Committee and my learning at his hands continued. He is articulate, thoughtful, and committed to the development of his country and while I do not always agree with his conclusions on different issues, in any discussion with him I am always brought face to face with new ideas and a new and better understanding.

The world is filled with good wishes for developing nations and all too often ill conceived and poorly executed plans to "help" with their development. This book makes a contribution to our understanding from someone seeing the issues from inside and we would do well to listen to what he has to say.

Dr. John M. Boyd
President, International Federation of Consulting Engineers
August 4 2009

INTRODUCTION

The idea of this book started as the history of ACEN over its then 25 years, initiated by the president from 2004 to 2005, Edet Amana. The basis of this calculation was the date of registration of ACEN with the Corporate Affairs Commission, July 1979. By the time of the commencement of the second effort to write the book, five years had passed, and the book became 30 Years of ACEN. In reviewing the historical documents, it was found that ACEN had joined FIDIC in 1977, making it at least 32 years old. Writings by the founding President and Secretary, F. A. O. Phillips and V. O. Oyefodunrin respectively, recorded the first meeting as having been held in 1971, and regular meetings thereafter, making ACEN 38 years old in 2009.

ACEN was not the first engineering association in Nigeria, but emerged from the evolving events in Nigeria as a country, and in engineering as an industry. The history of ACEN could therefore be best appreciated only if it is situated within the social, economic and political environment of the country as a whole. This is what this book has attempted to do. In pursuing this direction, it was found that engineering as an industry has not been used as a strategic tool for development. Indeed, the colonial administration did the reverse, by not developing engineering capability, they ensured the underdevelopment of the country and long term dependence on foreign technology, experts and imports. The succeeding civil and military administrations did not appear to have appreciated the strategic value of engineering to development. The country wanted infrastructures and industrialisation without indigenous ownership of technology. The result has been even greater dependence on foreign expertise.

The need to shout out to all those who should hear that Engineering is Development was strongly felt, hence the title of the book. It is strongly believed that without the development of engineering capability, development remains an illusion.

The book is in fifteen chapters. The first three chapters review the situation in the pre-colonial period, the colonial period and in the decade immediately after independence in 1960.

The next eight chapters present the history of ACEN within the prevailing economic and political environment in the country. Starting with the formation of ACEN in 1971, it reviews the booming seventies, the stressful eighties, the tense nineties and the hopes of the new millennium. It looks

at the members of ACEN and their firms and projects; and at ACEN Insurance Company, ACENICO, which was formed and nurtured by ACEN. It reviews ACEN's relationship with other engineering societies in the country, mainly the Nigerian Society of Engineers, NSE, and the Council for the Regulation of Engineering in Nigeria, COREN. The eight chapters end with the review of ACEN's international relations, mainly through its membership of the International Federation of Consulting Engineers, FIDIC and its Group of African Member Associations, GAMA.

The last three chapters attempt an analysis of development planning in Nigeria and conclude that while engineering is key to all facets of development, its strategic importance has not been understood or appreciated by the national leadership and planners. This is not, however, a scholarly or academic work but the simple analysis of an industry player. It is not, in fact, the opinion of the Association of Consulting Engineers Nigeria but that of the author.

The book ends with a clarion call to all to act to save the engineering industry and consequently, our country.

CHAPTER 1

BEFORE MODERN ENGINEERING

Images Above:
Kano Dye Pits. by Dr James Shepherd

Images Opposite:
Top: Tie-Dye product being sold at the market. by Dr James Shepherd
Bottom: Dipping fabric into Dye. by Sheila Tang

CHAPTER 1

BEFORE MODERN ENGINEERING

Engineering is taken for granted in today's world. Yet, man has not always had engineering as we know it. The history of engineering is necessarily the history of modern civilisation. Life today is so dominated by engineering accomplishments that it is hardly noticed, almost like the air we breathe. Whether in the area of health care or transportation, agriculture or entertainment, communication or housing, it is engineering that has made all the difference. A brief review of life before modern engineering should therefore be revealing.

History tells us the story of man on earth since about 10,000 years ago. In the beginning, he explored and exploited its resources in a very rudimentary way, foraging the forests for fruits and small animals that he could pick without efforts. He then learnt to use sticks and stones to catch resources beyond his immediate reach. These eventually gave way to spears, bows and arrows to reach even further.

For transport, he mostly walked and camped at river banks. He then learnt to cross streams using logs, the precursor of the canoe. Much later, he learnt to tame animals, which allowed him to travel relatively long distances. When he was ill or injured, he sought solutions by trying herbs or incantations, not having any understanding of the basic principles of such remedies, and by trial and error he got some right. The weather cycle caused him to store food and seek warmth. The discovery of fire must have had much greater significance to him than what electricity is to us today.

Wars have been a major part of world history. The early man relied on his muscles, speed, sight and instinct to fight. Wars were waged by person to person contact, with the stronger and fitter subduing the weaker. Then came the sword and the shield, weapons that created advantage but still required person to person contact. The catapult, spear and the bow and arrow were the earliest weapons that inflicted casualty on the enemy without physical contact.

By cumulative experience, observations and intuition, the early man responded to his immediate challenges. All these developments took hundreds of years to take place. It is this making of things through experience and practice that essentially constitutes craftsmanship, the essence of early engineering. Practice over time breeds knowledge, familiarity and competence, the basic ingredients of craftsmanship. Ingenuity exhibited in this way was what was considered as engineering in the earliest times.

The achievements of these early engineers and craftsmen were great and marvellous, often exhibiting great vision and ingenuity. The seven wonders of the ancient world are all the work of these engineers, artisans and craftsmen. The Great Pyramids of Giza (the only one of the seven ancient wonders remaining), the Hanging Gardens of Babylon, the Colossus of Rhodes, The statue of Zeus at Olympia, the Mausoleum of Maussollos at Halicarnassus, the Light House of Pharaoh at Alexandra and the Temple of Artemis at Ephesus were all magnificent edifices.

The Stonehenge in England, the Colosseum of Rome, the Catacombs of Kom el Shoqafa in Egypt, the Great Wall of China, the Porcelain Tower of Nanjing in China, the Hagia Sophia in Turkey, the Leaning Tower of Pisa, the Taj Mahal in India are among the marvels of early engineering and craftsmanship still in existence.

Yet, the quality of life did not improve significantly for much of this period. Again, history tells us that the improvement in quality of life over 9,500 of the 10,000 years of recorded history was indeed very small, and differences in ancient civilisations from place to place were also very small. From Mesopotamia, Ancient Egypt and Ancient India of early times to the Incas of South America and the Aztec and Maya civilization of Mexico, they all demonstrated about the same level of quality of life and used human and animal labour, craftsmen and artisans to create and maintain their civilisations.

Pre-colonial Nigeria was basically a collection of pre-modern engineering settlements and civilizations with their own landmark achievements in arts and crafts and urban settlements.

Iron smelting and forging technologies are known to have existed among the Nok Culture of Nigeria as far back as the 6th Century BC. Iron was fundamental to the rise of several kingdoms in Nigeria especially Benin and Ife and this technology thrived between 1400 and 1600. Sites at Igbo-Ukwu have revealed hundreds of ritual vessels and regalia castings of bronze that are among the most inventive and technically accomplished bronzes ever made. They were able to work metals through hammering, bending, twisting and incising. Items found include pendants, crowns and breastplates, staff ornaments, swords, and fly-whisk handles.

According to J. F. Ade Ajayi in the History of the Nigerian Society of Engineers,

> *Other highly skilled crafts found include the metallurgy of the blast furnaces of Saki; the blacksmithery of Awka; the technology of Jukun salt mines and the dye pits of Kano; the fortifications of the complex Benin walls; the architecture and construction of the Zaria Friday Mosque; the war canoes of the Delta Ijo; the "enormous barges" of the Kede people, each with 2-ton capacity of which the ruler of Kede had 600 in 1830; the irrigation works on Mambilla Plateau; or the Sukur causeway. According to Kirk-Greene (1983),*
>
> *"this paved stone causeway some five feet wide and two miles long descends from the northwest gate of the Hidi's palace to the Maggar Valley some 1,500 ft. below ... a truly remarkable causeway which even now ranks as a feat of engineering by its easy gradient and by the span and the smoothness of the paving stones many of which weigh hundreds of tons".*

The Scientific Revolution

Man has always wondered how things work. In the pre-scientific period, philosophers observed nature and made deductions based on these observations, and many of them turned out to be extremely insightful. For those things that could not be physically observed, explanations were mostly mythical or spiritual, without any basic understanding. The earliest curiosity was about the heavenly bodies, the earth, the moon, the sun and the stars; the duration of the day, month and year; the seasons, among others. The world thought the earth was flat for centuries and to think otherwise at some point was considered heresy. The world also thought that the earth was the centre of the universe until Copernicus assembled all the existing evidence to demonstrate that the earth did indeed revolve round the sun. Astronomy aided navigation and by the 15th Century, the Portuguese and Spanish were able to sail round the world.

The study of mathematics is recorded to be very ancient. Pythagoras lived in Greece around 500BC, and the Pythagoras theorem of the right-angled triangle was known as far back as then. The study of physical sciences, particularly physics and chemistry however, only became the pre-occupation of thinkers and philosophers in the 17th and 18th century and, from this time, much of our understanding of the forces that hold and control nature became understood. Isaac Newton published his famous book, Principia Mathematica in 1867 in which he presented the laws of gravity and laws of motion. Michael Faraday (1791-1867) worked in the field of electricity and magnetism. Robert Boyle (1627-1691) worked in the field of chemistry and is best known for Boyle's Law which established the relationship between volume, pressure and temperature in gases. The understanding of gravity, electricity, magnetism, light, sound and heat as the basic forces of nature were the outcome of this period. From these, the basic sciences of engineering emerged.

Albert Einstein (1879-1955) was later to publish the Theory of Relativity in which he presented the famous equation of E = mc2 showing that mass could be converted to energy, and the Special Theory of Relativity which reconciled mechanics and electromagnetism.

There was also a better understanding of materials and their composition. The development of the Periodic Table in 1869 is credited to Mendelev and the elements that constitute the earth, the basic concepts of the atom, the element, compounds and materials as we know them were all products of this period and our understanding improved significantly.

Emergence of Modern Engineering

The science revolution gave birth to engineering as we know it today.

The word engineer originated in the eleventh century from the Latin word ingeniator, meaning one with ingenium, the ingenious one. The name, used for builders of ingenious fortifications or makers of ingenious devices, was closely related to the notion of ingenuity, which was captured in the old meaning of "engine" until the word was taken over by steam engines and its like. Leonardo da Vinci bore the official title of Ingegnere Generale. His notebooks reveal that some Renaissance engineers began to ask systematically what works and why.

Modern engineering is, however, not this gradual evolution of skills and competences through practice and experience, great as the accomplishments of these early philosophers were. Rather, it is the more deliberate use of knowledge of science and mathematics to produce goods and infrastructures for the convenience of man and society. Not only did it improve the quality of life significantly,

civilisations that were hitherto unsustainable developed and have thrived until the realities of today. It is for this reason that a school of thought considers the present challenges of environmental sustainability as having been caused by science and engineering.

The United Kingdom's Institution of Civil Engineers' original charter in 1828 defined Civil Engineering as:

> *"...the art of directing the great sources of power in nature for the use and convenience of man, as the means of production and of traffic in states, both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation and docks for internal intercourse and exchange, and in the construction of ports, harbours, moles, breakwaters and lighthouses, and in the art of navigation by artificial power for the purposes of commerce, and in the construction and application of machinery, and in the drainage of cities and towns."*

Similarly, the American Society of Civil Engineers in 1961 stated as follows:

> *"Civil engineering is the profession in which a knowledge of the mathematical and physical sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the progressive well-being of humanity in creating, improving, and protecting the environment, in providing facilities for community living, industry and transportation, and in providing structures for the use of humanity."*

The first phase of modern engineering emerged from the Scientific Revolution. Galileo's *Two New Sciences*, which sought systematic explanations and adopted a scientific approach to practical problems, was a landmark publication regarded by many engineering historians as the beginning of structural analysis, the mathematical representation and design of building structures. This phase of engineering lasted through the First Industrial Revolution, when machines, increasingly powered by steam engines, started to replace muscles in most production. As part of the revolution, traditional artisans in England transformed themselves to modern professionals. The French spearheaded civil engineering with emphasis on mathematics and developed university engineering education under the sponsorship

of their government. The British pioneered mechanical engineering and autonomous professional societies. Gradually, practical thinking became scientific in addition to intuitive, as engineers developed mathematical analysis and controlled experiments. Technical training shifted from apprenticeship to university education. Information flowed more quickly in organized meetings and journal publications as professional societies emerged.

The scientific revolution also gave birth to the science of engineering, with detailed study, observations and research in the areas of engineering application. Early civil engineering researchers include Osborne Reynolds (1842 – 1912) in the field of hydrodynamics, particularly his identification of the Reynolds Number, the fundamental dimensionless parameter that characterises the flow of fluids; and Karl Terzaghi (1883 – 1963) and Arthur Casagrande in Soil Mechanics. In Mechanical Engineering, James Watt (1736 – 1819) made fundamental improvements to Thomas Newcomen's steam engine and was catalyst to the industrial revolution. The Wright brothers, Orville (1871 – 1948) and Wilbur (1867 – 1912) developed the first powered, sustained and controlled airplane in 1903. In Electrical Engineering, Alexander Graham Bell (1847 – 1922) invented the telephone, while Thomas Edison (1847 – 1931) had over a thousand inventions, the better known of which include the incandescent lamp, the phonograph, the generator, and commercial electric light and power system.

Notable early engineering accomplishments include the Suez Canal (Constructed 1859-1869) linking the Mediterranean Sea to the India Ocean, the Panama Canal (1904-1914) linking the Atlantic with the Pacific, the Eiffel Tower (1889) in Paris France designed and constructed by Gustav Eiffel; the Grand Junction Railway (1837) which is the first trunk line linking the Liverpool-Manchester line with Birmingham, the Metropolitan Line (1863) which is the first underground railway, and the completion of the trans-continental railroad in the United States in 1869.

In manufacturing, Karl Benz produced the first commercially available automobile, the Benz Patent Motorwagen in 1886, and Henry Ford mass produced the Model T Ford car in 1908 for mass consumption and made the motor car available to the masses. From 1881, hydro-electric power has been generated from the Niagara Falls.

Engineering and Development

This understanding and mastery of the forces of nature and its use for the advancement of humanity provided great advantages to the societies that mastered them, and have continued to do so even till today. By being able to produce goods more efficiently than before there was enough to go round, thus improving the quality of life. By creating new tools and techniques, people were relieved of the drudgery of living, and even more could be accomplished. This improvement in efficiency in turn created free time for society to indulge in other activities such as philosophy, entertainment, commerce and other endeavours, leading to civilization as we know it today.

The first nation to master these new knowledge and skills was the United Kingdom, during the scientific and industrial revolution. This allowed the UK to lead and dominate the world for over a century. With manufacture, trade boomed, and prosperity grew in Britain. With increased income and technology, infrastructure grew tremendously. From canals to trains and roads, Britain developed transportation infrastructure that still holds its own today.

Indeed, the impact of engineering development in England was so great that when the result of a poll conducted in November of 2002 by the British Broadcasting Corporation to determine the greatest Briton of all times was announced, the runner up was a Civil Engineer, Isambard Kingdom Brunel. A university is named after him in West London to commemorate his achievements. The reason for his overwhelming vote was given as follows:

> *Brunel built modern Britain, and Britain built the world, which means that Brunel built the modern world.*

Only Winston Churchill, who as Prime Minister successfully led Britain to victory during the Second World War from 1939 to 1945, beat him to the second place in this BBC poll.

Europe, led by Germany and France, also followed and their nations developed similarly. The first settlers in the United States of America came from Europe with this technology. With this competence, they were able to take over the land from the native Indians and develop it to a great nation that has led the world since the Second World War. Russia and Japan mastered the technology and developed their economy.

Today, China and India are developing at great speeds. The underlying basis of this development is, however, the mastery of the knowledge of the forces of nature and their ability to use it for production.

Every nation that has become great in the last three centuries without any exception has had to master science and engineering. Development has neither been the exclusive preserve of democracy or autocracy, for science and engineering did develop as much under Winston Churchill as well as Adolph Hitler. Development is neither about capitalism nor communism, for the Soviet Union, China and the United States have exhibited and benefited from the mastery of this field of endeavour. Development has also not been about race or religion, for a very wide variety of races and religions of the world have mastered and benefited from science and engineering. Development has not been driven by the presence or absence of local raw materials. Nations with and without resources have all developed.

What is common to nations that have not developed is that they have not appreciated the critical importance of science and technology to development, and have not given it the concentrated and focused energy that it needs. Africa, more than anywhere else in the world today, demonstrates this. As soon as the world moved away from the age of consumption of raw materials, the gap between African nations and the rest of the world began and has continued to widen. Africa is increasingly unable to provide the basic necessities of life for its citizenry, from clean water to food and clothing, from housing to education and health care, from transportation to energy supply. Africa is not even able to develop its own natural resources, be it petroleum, coal or tin mining, modern agriculture or trade. The lack of productive capacity has resulted in a subsequent lack of competence on secondary fronts such as governance, peace, law and order. This has resulted in the very low self-esteem exhibited by Africans themselves, and being looked down upon by the rest of the world.

In the first of the 'October Lecture' series of the Nigerian Society of Engineers in 1980, Chief Adeniyi Williams, in his paper 'Nigeria and Her Engineers', wrote:

> *As was stated 20 years ago at an international conference by Sir John Cockcroft, a renowned English physicist: "The capacity of science to advance the life of the so-called New States depends, more than on any single factor, upon recognition by the Government of a State*

of the importance of science to its economy and a willingness to devote adequate resources to the advancement of science and technology. In many new states these prerequisites are lacking."

This is the true picture of Nigeria and most underdeveloped countries today. Even though it is almost 50 years since we attained independence, it would appear as if we have inherited from our colonial past the apathy which exists today in the attitude of the Government to engineering and technology.

It is the nations with this lack of production capability, and its consequent low and dependent quality of life that are called the third world, or developing nations, or less-developed nations. They are dependent on other nations for basic survival and look up to donor agencies, foreign scholarships, and international and similar organisations for survival.

This is why we make bold to say that Engineering Development is National Development.

CHAPTER 2

MODERN ENGINEERING ARRIVES

Images: The railway was one of the earliest engineering projects in Nigeria
Above: Rail Line, symbolic of arrival of engineering. Source: iStock
Opposite, top and bottom, Zungeru Railway Station. by Dr. James Shepherd
Inset: Founding Chairman of ACEN FAO Phillips receives award
from his boss. Source: FAO Phillips Family Photograph

MODERN ENGINEERING ARRIVES

At the peak of the industrial revolution, Britain was considered to be at least a hundred years ahead of the rest of Europe in the early 19th Century. Science was thriving and inventions abundant. It was therefore with extreme confidence and a sense of superiority that the British arrived on the shores of Nigeria as in several other British colonies. What Nigeria had to offer, on the other hand, was at best a culture of craftsmanship and artisans, without basic understanding of the forces that control nature. It was therefore with disdain that the new arrivals looked at the little technology that was available. Everything was condemned, the good and the bad alike. Unlike in the UK where the craftsmen and artisans were able to make the transition into engineering, the Nigeria of the 19th Century did not have this opportunity, and much of the little that there was got replaced with the new technology.

Too frequently, the traditional arts and crafts are romanticised as technological heritage to which we could return. In reality this is not so, as modern engineering development was a transformation and not a continuation of the old. According to Chief Adeniyi Williams,

> *In this regard one tends to agree with Sir Arthur W. Lewis when in an address on a wider context remarked: "much that the traditionalists weep over and think so special to their own geography, is really no more than the universal culture of poverty which could not possibly survive development". Or as succinctly put by one of our foremost national figures recently - and I quote "Is it because we cannot go forward that we want to go backward?"*

Some of the more useful and relevant crafts and technology that were prohibited by the British include tin collection and smelting which was made illegal in 1913, and the distillation of alcohol from palm wine and other base products among the Ijo of the Niger Delta, Erin Oke, now in Osun State and several other places. This attitude delayed the technological development of the country. Unfortunately, the early emergent leaders, including many scientists and engineers, inherited and continued this policy of de-linking. Over time, the indigenous technology became completely lost, and the country was left technologically barren.

It is of course easy to understand why it must have been difficult for the British to introduce modern engineering into Nigeria at the time of their arrival. There was no formal schooling, and therefore people did not read and write. All learning was oral and by apprenticeship. It would therefore have taken years for the basic mathematics and sciences to be taught before engineering could be understood and appreciated, and this was indeed what happened. The priority of the British was, however, not to bring civilisation to the territories but to exploit it for the development of Her Imperial Majesty, Queen Victoria. The education of the natives was therefore oriented towards assisting the new rulers rather than their empowerment.

The early period of colonization marked the beginning of modern engineering in Nigeria and the earliest projects were to consolidate imperialism. According to Chief Adeniyi Williams,

> *The first engineering structure of any magnitude undertaken in the country was the old Carter Bridge which was built to connect Lagos Island with Iddo. The length of the bridge was 2,110 ft. and the substructure consisted of 10" screw piling screwed down into strata of blue clay. The length of piles varied from 47ft. to 77ft. The road way was 20ft. wide. There was a swing type centre span 123 ft. long; and when this was opened for the passage of river vessel the operation took more than an hour during which time road traffic was at a standstill and the water supply to Lagos Island cut off.*

Three other major infrastructure projects came into existence during this early period. The first was the telecommunication system, to ensure efficient communication between the rulers and ruled. The second was the railway line, to move agricultural products from the hinterland to the coast for export. The third was the Denton Causeway to move products from the Iddo Terminus to the port in Lagos. Chief Adeniyi Williams went on:

> *The telegraphic system for the British administration commenced in 1886 in Shaki, now in Oyo state. In 1895 the Lagos Government Railway was established at Iddo, and in 1896 the 3' 6" narrow gauge railway line from Ebute-Metta to develop the hinterland was begun. The first phase from Lagos to Ibadan was opened to traffic in 1900; then it was continued northward with its branches to various parts of Eastern and Northern Nigeria. It was then described as a fast train because it would cover the 700 miles from Lagos to Kano in 43 hours at an average speed of 16.28 miles an hour.*

The first Water Supply to Lagos was commissioned in 1912. The building of the old General Post Office on Marina in Lagos is generally regarded as the first major public work of the colonial era, though, as an engineering achievement, it hardly compared with the Catholic Holy Cross Cathedral on Catholic Mission Street, or the Christ Church Cathedral on the Marina.

The contract for the feasibility study of the railways was awarded in 1894 to Shelford Consulting Engineers, while a harbour improvement project was awarded to Messrs Goode, Son and Mathews. These are probably the first consulting engineering projects in Nigeria. Operating under the direction of Mr. William Shelford, a charted engineer, the firm carried out feasibility study on the Lagos to Jebba railway. Following the Shelford Report, work started in 1896 on the railway from Iddo, reaching Otta in September 1897, Abeokuta in 1899, and Ibadan in December 1900. The first 60 miles to Abeokuta was opened to traffic on September 30, 1899, built at a cost of £398,725. Further work was delayed by the South Africa War and by debates about the relative merits of construction by contract or by the Public Works Department (PWD). Construction was resumed by the PWD in 1905, reaching Jebba in 1909, and Minna in 1912 though the Jebba Bridge was not completed until 1914. The Lagos Steam Tramway was built in 1901-2 as an extension of the Railways. It was intended to link the wharves with the Iddo Railway Terminus, and provide public transportation on Lagos Island before the advent of cars. In the end it proved too heavy for the old Carter Bridge, but it provided service on the Island until 1913 when it was replaced by the Anfani Bus Service of Mrs. Obasa.

Engr. F. A. Oseni, in his writing for this book added:

> *The planning and design of Carter Bridge was carried out in London by the Crown Agents, a quasi-autonomous non¬governmental organisation (QUANGO) that was set up by the Colonial Office to procure supplies for the colonies. The Crown Agents had an engineering Department, which functioned like a consulting firm although it also used independent consulting firms such as Alexander Gibbs and Partners and Halcrow and Partners. Engineering designs were based on using units prefabricated in the United Kingdom, which were then shipped to the colonies to be assembled on site. This gave rise to the Calendar-Hamilton steel truss bridges still found along old or abandoned alignment of some roads in the country. The British engineers in the Railways and the Public Works Departments of the local colonial administration trained fitters to assemble the prefabricated units.*

The introduction of motor vehicles to Lagos between 1907 and 1909, and railway locomotives on the completion of the rail lines introduced mechanical engineering practice into the country. The establishment of the Electricity Corporation of Nigeria, ECN, brought electrical engineering practice. The pattern of development from buildings to infrastructures and machines will appear to have influenced the choice of careers among the first generation of Nigerians engineers, and the dominance of civil, mechanical and electrical engineering in that order.

The early engineers were of course all expatriates who were not necessarily members of the British Institutions but had their training and experience in the military elsewhere in Africa and other parts of the British Empire. Most of the projects were carried out in-house under the Public Works Department, PWD.

J. F. Ade-Ajayi, in the History of the Nigerian Society of Engineers wrote:

> *Engineers in this period were few and multi-tasking. In ECN for example, up to the 1940s, there were only two engineers managing the distribution of electricity in Lagos. They were called Mains Engineer (Island) and Mains Engineer (Mainland) respectively. Their duties included planning, construction and maintenance of electricity distribution services throughout Lagos from the two service centres - Ajele in Lagos Island and Martin Street, Oyingbo on the Mainland. The only instruments conspicuously displayed on the engineers' tables then were the voltmeter, clip-on Ammeter and 500 Volt Meter. Instruments like High Voltage D.C Set, Fault Localizers, etc. were unknown. Most of the high voltage feeders were protected with mere cartridge fuses except in a few switching stations where ordinary over-current and Earth-fault relays were maintained.*

Pre-Independence Education

The need for trained manpower to assist the colonial government in all disciplines became very clear. It necessarily had to start with primary and secondary schools, and the earliest primary schools were established around the 1850s, to be followed by secondary schools run by missionary organisations. The earliest secondary schools are Lagos Anglican

Grammar School (1859), Methodist Boys' High School (1878), Methodist Girls' High School (1879), Baptist Academy (1885), all in Lagos, and Hope Waddell (1895) in Calabar. The first government secondary school in the country, King's College, Lagos was established by an act of the British Parliament and founded in 1909. The oldest secondary school in the north is Barewa College, Zaria, founded in 1922. Dennis Memorial Grammar School was established in Onitsha in 1925 and Government College Umuahia in 1927. By independence, there were well over fifty secondary schools all over the country. The focus of these early schools was to supply the administrative cadre staff required to run government, and most of the early graduates went into the civil service.

The need for higher education soon became clear, and Yaba Higher College was established to prepare students for the London Matriculation Examination. The first full university was the University College, Ibadan founded in 1948. Its focus was on liberal arts and medicine, and engineering and applied sciences were not offered. The colonial administration adopted a policy of awarding scholarships to selected students to study engineering in British and Commonwealth universities. The recipients of the scholarships became the first set of indigenous professional engineers in the country when they started returning home in the early 1950's; and in accordance with the bond they signed as part of the conditions of their scholarship awards they joined the colonial civil service.

Pre-independence Nigeria also trained people on the job, in the tradition of British technical training. The Railways, Post & Telegraph (P&T) and Public Works Department (PWD) recruited and trained people in technical training schools and many of them took the City & Guilds vocational examinations. The more determined ones went on to obtain full degrees in their respective fields.

A few of the more exposed and affluent parents were able to send their children abroad to obtain university degrees in the United Kingdom, sailing to London by boat and not being able to visit or speak to anybody from home for upwards of four years. The P&T was of course very efficient, and letters were regularly exchanged.

It is from this environment that the first set of Nigerian engineers emerged.

According to Chief Adeniyi Williams,

> *Engineering came third to law and medicine in the order in which these professions attracted Nigerians. The first Nigerian to qualify as a professional engineer, and perhaps the first in the whole of black Africa, was Herbert Heelas Macaulay. He was elected Associate Member (Corporate Member) of the British Institution of Civil Engineering in 1893. The first Nigerian to obtain a university degree in engineering was George Debayo Agbebi who obtained the B.Sc. degree of Birmingham University in 1911 before enrolling as a Fellow of the Geological Society and a member both of the British Astronomical Association and the Royal Sanitary Institute (Macmillan, 1920, p 17). Almost twenty years later, Isola Phillips obtained 1st Class Honours B.Sc. of Bristol University in 1930. Thereafter, Robert Starveley qualified in 1934, Adekunle Coker in 1935 from Glasgow, Ekundayo Ajayi and Adeniyi Williams in 1936 from Birmingham. All these were civil engineers. Oladotun Coker, the first Nigerian electrical engineer, trained in America and served with the Associated Tin Mines before joining the ECN where he worked till his death in 1959.*

The founding president of ACEN, F. A. O. Phillips, became a graduate member of the Institution of Mechanical Engineers through apprenticeship and correspondence studies in 1943, Associate Member in 1948 and a Fellow in 1958. Along with those listed by Adeniyi Williams, these could be referred to as the first generation of Nigerian engineers.

Most of the early engineering graduates in Nigeria had difficulties being absorbed into government employment. Dominated by foreign engineers, acceptance of the indigenous graduates was slow and painful. The experience of Adeniyi Williams who graduated in 1936 and was there at independence was particularly telling. He had this to say about the early engineering graduates in Nigeria:

> *".....of all these, only four worked in the civil service of the Nigerian government. Initial salaries offered ranged from £96 to £128 per annum. Some refused these salaries, and set up in private practice mainly as licensed surveyors. One went over to the Gold Coast (now Ghana) to earn about 3 to 4 times the salary offered him in his own country. At the time when I joined the service, the presence of a Nigerian in the cadre of engineers in the Public Works Department was a complete novelty. Somehow you felt that nobody seemed to know what to do with you. You*

were looked upon as an oddity. The department was not even sure as to what to call me. I was first designated Cadet Engineer, then Nigerian Engineer, then plain Engineer; and it was in 1945 after 9 years of service that the proper designation of Executive Engineer was applied to me along with a revision of salary. What of my own people? Some of my friends could not understand why I have chosen a profession which they considered to be lack-lustre when I could easily have been a doctor or a lawyer like them……"

This same sentiment was echoed by another engineer, Engr. S. A. Alaka, who studied engineering in the fifties. His father, a successful land surveyor, could not understand why he chose engineering when the few engineers in the society did not appear to be doing well compared with doctors, lawyers and surveyors.

The reality was, however, that engineering holds its own intrinsic attraction to young people with curiosity as to how things work and how to make things, and no amount of discouragement was sufficient to kill this interest then, or even now.

Yet pre-independence Nigeria was not without its own engineering achievements. The early nationalists fought for independence with the promise to improve the lots of the citizens. In 1954, limited self-government was granted to the regions, and elections were held and governments and parliaments constituted in the Western and Eastern Regions of the country, and later in 1957 in the Northern Region.

The Western Region Government under the leadership of Chief Obafemi Awolowo exemplified the best in Nigerian development. As early as 1955, it introduced free primary education in the region and availed millions of children the opportunity for western education and its consequent advantages. It introduced the radio to houses via cable connections and thus encouraged the dissemination of information. This was ultimately crowned with the introduction of the first television station in black Africa, the Western Nigeria Broadcasting Corporation, WNBC-WNTV.

The 35,000 capacity Liberty Stadium was initiated and completed in time for Nigerian independence in 1960 and was the first of such edifices in the country. I was particularly privileged to sit there as a nine year old boy to celebrate the independence anniversary in 1960.

The Western Region government also deliberately attracted industries to the country by creating the Ikeja Industrial Estate and its complementary residential area. With this creation, manufacturing opportunities were provided to complement the agricultural base of the economy.

In addition to physical construction, Western Region government of the pre-independence period also encouraged local contracting capacity. Local contracting firms included T. A. Oni and Sons, Adebayo and Olatunbosun, Abdullahi and Awomolo, J. F. Ososami, Akin-Deko, Foye Builders, Lucas and O'Dwyer, Unity Contractors, Majekodunmi, Idowu Bros and Solan and Sons. These contractors were very well patronised by the government. According to Richard I Scar,

Perhaps the most notable and successful of these companies was T. A. Oni and Sons. T. A. Oni (1913 – 75) after his primary education, joined the Public Works Department in 1930. He resigned in 1945 with £2,000 capital to set up as a civil engineering and construction company in Ibadan. In the mid-1950s, his firm had contracts worth £0.5m. In the early 1960s, the company along with two partnerships, Adebayo and Olatunbosun, and Abdullahi and Awomolo, were the only indigenous construction companies classified in category G, allowing them to bid for contracts of over £1,000. In 1973, the company merged with Royal Netherlands Harbourworks to form Harboni. The merger was never successful. Oni died in 1975.

Lagos was still being run as a federal colony, and the Lagos Executive Development Board (LEDB) carried out several notable engineering projects in the Lagos Colony. Lagos area is part of the alluvial stretch that extends along the most of West Africa from the Cameroon to Sierra Leone. It therefore consisted of isolated islands and swamps and reclamation through sand filling was a major activity. Parts of Lagos Island itself, notably Idoluwo area, Marina, Olowogbowo were reclaimed. Other major reclamation included Apapa, parts of Victoria Island, Iponrin and parts of Surulere. The development of North-West Lagos, to be later known as New Lagos and eventually Surulere today was perhaps the most visible and notable achievement of LEDB. Notable Nigerian engineers of this organisation included Chief S. O. Fadahunsi, Dr. T M Aluko and Mr. E. O. Ogundiya.

The national colonial government itself, in addition to the provision of major infrastructures including roads, railway and ports, developed

the housing estate for expatriates in Ikoyi, the Ikoyi and Federal Palace Hotels and the 20 storey Independence Building, the tallest building in tropical Africa at the time.

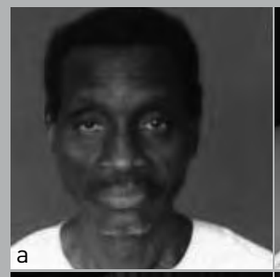
Other major engineering related achievements of this period included the establishment in 1948 of the first university in Nigeria, the University College, Ibadan, and the implementation of the recommendation of the Ashby Commission on training of 2,500 technicians yearly with emphasis on practical training. This gave birth to the establishment of four polytechnics located in Ibadan, Auchi, Enugu and Kaduna.

The Birth of the Nigerian Society of Engineers, NSE

With increasing number of both indigenous and foreign engineers in the country, the creation of a platform for sharing professional experience and networking was only a question of time.

The first of such platforms was the initiative of the British Institutions and was initially targeted at British engineers in West Africa. In 1941 the three major British Institutions of Civil, Mechanical and Electrical Engineers agreed to standardize conditions for admission and operate a joint preliminary examination. Between 1948 and 1949, they agreed to cooperate in creating the "Joint Overseas Group" to cater for their members where no local association existed. A West African Joint Group was thus established in 1953-1954, with branches in the then three regions of Nigeria and in Ghana. About the same time expatriate firms of engineers began to establish branches in Nigeria, seeking to break the PWD monopoly over government engineering constructions and bidding for contracts for major engineering consultancies and construction. The West African Joint Group helped the Nigerian engineers to enjoy better comradeship with their expatriate counterparts than had hitherto existed. This, however, merely reduced the old antagonism and introduced new commercial rivalries when Nigeria got its independence in 1960.

There was every need for an organisation of engineers imbued with nationalist zeal and courage to decolonise and grow the practice of engineering in Nigeria and protect the interest of Nigeria and Nigerian engineers. A group of students and graduate engineers in London got together to promote such an association and this gave birth to the Nigerian Society of Engineers (NSE). On the 16th of February 1958, the NSE was inaugurated in London under the chairmanship of Mr. G.O. Aiwerioba, but was not legally incorporated. The formal incorporation of the NSE took place in Abeokuta, Nigeria on January 19, 1959 with Chief Adeniyi Williams elected as its first president.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CHAPTER 3

THE TURBULENT SIXTIES

Images Opposite:
Images a – i: Principals of firm formed before 1970;

a. Adegbola Tokun
Osot Associates, 1969
b. Adenrele Adejumo
Adejumo & Partners, 1966
c. Goke Bamgbopa
Civ-Struct, 1968
d. Bosun Oke
Civ-Struct, 1968
e. Adeniyi Olumide
Osot, 1989
f. Obi Obembe
Obi Obembe & Associates, 1958
g. Iyiola Omisore
Iyiola Omisore & Associates, 1963
h. Alaba Akinsete
Finco Engineers, 1969
i. Charles Agbim
Agbim & Associates, 1965

Images j and k:

j. Federal Cabinet at the time of Promulgation of COREN Decree
k. Mr. Femi Okunnu, Commissioner for Works and Housing at the time of Promulgation of COREN Decree

Image above: Soldier at War, reflecting the civil war in Nigeria. Source: iStock

CHAPTER 3

THE TURBULENT SIXTIES

Throughout the late 1950s and early 1960s, Nigeria was perceived by most western countries as a promising example of thriving democracy in black Africa. There were a decent number of university graduates and professionals in several fields including law, medicine and engineering. There was a university, a university college, a college of medicine and a polytechnic. Self-rule had been tried at the regional level and reasonable progress had been made. These were positive indicators that self-governance could thrive in Nigeria.

There were, however, other challenges. The political parties had become very strongly regional and ethnic. The different regions of the country were at different levels of development educationally, and in readiness for self-government. The level of literacy and awareness precluded issue-based debates. The general citizenry could not really appreciate the concept of Nigeria and ethnic loyalties were much clearer and stronger.

As it turned out, these challenges could not be easily overcome and the Nigerian nation was soon engulfed in crisis.

The first national election held in December 1959 and the British handed over power to democratically elected Nigerians on the 1st of October 1960. The election had been contested by three major political parties, the Northern People Congress, NPC from the north, the National Convention of Nigerian Citizens, NCNC with strong presence in the west but predominantly from the east, and the Action Group, AG, from the west. The election was fiercely contested and allegations of rigging dogged the results. At the end of the election, there was no party with enough votes to independently form a government, but the NPC had the highest number of elected delegates. A coalition was formed by the NPC and the NCNC. The constitution of the country was based on the British parliamentary system of government and Sir Abubakar Tafawa Balewa of NPC became the Prime Minister and Head of Government and Dr. Nnamdi Azikiwe of NCNC became the ceremonial President. Chief Obafemi Awolowo of AG became the Leader of Opposition.

Differences soon arose between Chief Awolowo who had now moved to the nation's capital, Lagos, and his successor as premier of Western Region, Chief Ladoke Akintola. The differences rocked the party. Akintola decamped from the AG and formed a new party, the Nigerian National Democratic Party, NNDP, but would not resign as the premier.

By this time the alliance between the NPC and the NCNC had broken down and NNDP became the new ally to NPC. This eventually led to the breakdown of law and order in the region. In the chaos which ensued, the federal government declared a state of emergency and appointed an administrator over the region. With the alliance between NPC and NNDP, the federal government was perceived as not being a neutral umpire. The Federal Government then proceeded to arrest and charge several of AG's key leaders with treasonable felony. They were tried, and many of them including Chief Awolowo were found guilty and jailed. At the December 1965 elections, NNDP, was declared the winner of the regional elections. The region erupted in spontaneous riots.

While the country continued to heat up politically, the reports in the western media remained positive, and Nigeria continued to play a prominent role in African and World Affairs, including sending troops to help quell the Congo crisis under the mandate of the United Nations. In January 1966, Nigeria hosted the first ever Commonwealth Head of Government's summit outside London.

Within hours of the end of the Commonwealth meeting in Lagos, on the 15th of January 1966, a group of soldiers staged the first coup d'etat in the country. The chief plotters were Majors Ifeajuna, Okafor, Anuforo, Chukwuka, Onwuatuegwu, Ademoyega and Nzeogwu. Leading politicians killed during the coup included the Prime Minister, Tafawa Balewa, the Premiers of Northern and Western Regions, Sir Ahmadu Bello and Chief Ladoke Akintola, and the Minister of Finance, Chief Festus Okotieboh. The coup was not fully successful, and in the disarray, the mainstream of the army took over the leadership and General Aguyi Ironsi, a soldier of eastern origin assumed the leadership of the country. Ironsi introduced a unitary form of government, suspended the parliament and appointed military governors for the regions.

The initial relief from the prevailing chaos provided by the coup soon gave way to anger and resentment, especially in the north, as the coup seemed to have benefited the east disproportionately. The coup leaders except for one person were all easterners, the new head of state was an easterner, and two very senior leaders from the north had been killed with no notable easterner killed. In May 1966, rampage erupted all over the north targeted at Igbos who as a result of their entrepreneurship were scattered all over the country and hundreds of Igbos were killed. A counter coup was staged by the northern military officers on the 29th of

July 1966. The head of the Federal Military Government, Major General Ironsi, the Military Governor of Western Region, Brigadier Adekunle Fajuyi and several senior army officers from the east were killed. After three days of uncertainty during which the country had no leadership, Lieutenant Colonel Yakubu Gowon, emerged as the Head of State and Commander of the Armed Forces.

Rather than peace ensuing, however, the situation deteriorated. Within three months of the second coup, civilian disturbances and tribal killings, on an unprecedented scale, erupted throughout the country. By September, thousands of Igbos had been killed. This triggered a mass return of people of eastern origin back to the Eastern Region. In an attempt to restore order, a decision was taken by the military government to post military personnel to barracks within their respective regions of origin. The civilians followed suit, and the Igbos converged in the east while non-Igbos left as their safety could no longer be guaranteed. By the end of 1966, Nigeria had become strongly polarised with most people returning to their regions of origin.

Angered by the perceived injustice and the persecution of the Igbos, the Military Governor of the Eastern Region, Lt Col Odumegwu Ojukwu began to consolidate his position with a view to seceding from the Nigerian entity. He seized federal assets in the east and stopped attending federal meetings. In response, the federal government imposed a total blockade on the east. Mediators, local and international, tried to make peace without success.

In a pre-emptive move to undermine the political integrity of the planned Republic of Biafra, the federal government announced the creation of 12 states in the country on the 27th of May 1967. By this move, Eastern Region was divided into three, East Central State, South Eastern State and Rivers State. This was to emphasise the ethnic differences among the peoples of the new states and take political advantage of this. Response from Enugu, the capital of Eastern Region was immediate. On the 30th of May 1967, the state of Biafra was declared. Initially announced as a military action to bring back the Eastern States to Nigeria, the Civil War broke out on 6 July 1967.

The Federal side expected a quick victory while the Biafrans saw the war as one of survival and were ready to fight to the last man. By August 1967, the war had been extended to the Mid-Western Region by the Biafrans with the aim to relief pressure on their northern front and to threaten the Federal Capital, Lagos. Both sides employed political, diplomatic, psychological and military strategies to prosecute the war.

The war was to last till 15 January 1970. Lt. Col. Ojukwu, realizing the hopelessness of the situation fled the enclave with his immediate family members on the 10th of January 1970. The Commander of the Biafran Army who took over the administration of the remaining enclave surrendered to the federal government on 14th January 1970 bringing an end to the war, secessionist attempt and bloodshed.

The immediate post-independence decade was therefore not a period of national development but rather, a period of turmoil and struggle with the preservation of the country as the primary focus. Rather than the hope and optimism that had been raised, it was political instability, violence and ethnic strife that confronted the nation. It is against this background that national and engineering development in the sixties must be evaluated and appreciated.

National Development in the 60's

On the eve of independence, the departing colonial administration prepared a development plan for the whole country. The philosophical, political and strategic basis of this plan, and how well it met the new national aspirations was, however, not clear. Therefore, soon after independence in October 1960, the federal government prepared what has been regarded as the first National Development Plan. The government examined the political economy of the nation in the light of the constitution and formulated policies for the orderly development of the whole country. Programmes and projects were planned to meet the five main objectives of the plan which were to make Nigeria:

> *"....a united, strong and self-reliant nation; a great and dynamic economy; a just and egalitarian society; a land of bright and full opportunities for all citizens; and a free and democratic society. "*

The Plan was to last from 1962 to 1968. Political instability and the civil war of July 1967 to January 1970 however interrupted the plan and not much was achieved. It was to be continued immediately after the war and was extended to 1974.

Achievement in engineering development in this decade will be reviewed

under the five headings of: Education and Training; Work Opportunities and Projects; Emergence of Practitioners; Research and Development; and Engineering Regulation

Basic education and the study of science is the primary input into engineering training, to be concluded in tertiary institutions where engineering is taught. The sixties did not see any significant increase in the number of primary and secondary schools in the country. According to the statistics for education in Nigeria 1960 to 1983-84, the number of primary schools decreased from 15,705 in 1960 to 14,967 in 1965 and 14,902 in 1970. Secondary schools increased only slightly from 1,229 in 1960 to 1,656 in 1965 and 1,385 in 1970. Recognising the need for technical capability, however, the government aggressively promoted the study of science. The Federal Emergency Science School was established in Lagos to provide opportunity for the study of advance level sciences. Many of the senior engineers of today graduated from this school.

A major achievement in the decade, however, was the significant increase in the number of tertiary institutions, the total number of which increased from four (University of Ibadan, University College Hospital, Ibadan, Nigeria College of Arts, Science & Technology, Zaria, and Yaba College of Technology) in 1960 to sixteen (6 colleges of education, 5 polytechnics and 5 universities) in 1965 and 20 in 1970. All the polytechnics had engineering focus and the universities had faculties of engineering. The universities are the Ahmadu Bello University, the University of Lagos, the University of Nigeria, Nsuka, the University of Ife and the University of Benin. The polytechnics are the Auchi, Ibadan, Kaduna and Enugu Polytechnics, and Yaba College of Technology. The Nigeria College of Arts, Science & Technology was the first to offer engineering degree as a college of the University of London. At independence, it became a full university, the Ahmadu Bello University, and was to produce the first crop of Nigerian trained engineers and architects, to be joined later by Lagos and Nsuka

The major employers of engineers in the sixties were the federal and regional governments. By independence, enough engineers had risen to senior positions in government, and independence provided opportunities for further elevation. Prominent engineers of the period included S.O. Williams, S.B. Audifferen, Adeniyi Jones, T.M. Aluko (the famous writer), J. C. Egbuna, Charles Nwariaku, S.O. Fadahunsi and F. A. O. Phillips. Engineering establishments of the period included the Public Works Department, PWD, the Lagos Executive Development Board, LEDB, the Post and Telegraph, P&T, the Railways, Ports Authority and Electricity Corporation of Nigeria, ECN. By far the biggest and most important was the PWD with responsibility for buildings and roads.

The private sector had also started to emerge. Construction companies had a head start in the construction industry in Nigeria and offered work opportunities for engineers. Some of them, including P.M. Obi & Co, Alex Nzegwu Construction Company Ltd., T.A. Oni & Sons Ltd., Banjoko & Sons, Akin Taylor & Co., Y. Salleh & Co. and Ali Musa & Sons were already registered in category G, the highest category and were being regularly patronised by governments.

Consulting engineering lagged significantly behind contracting, and no record of an indigenous consulting firm could be found for most of the fifties. The earliest indigenous consulting firm with records is Obi Obembe and Associates, founded in 1959. Consulting firms founded in the sixties, from ACEN records, include Omisore Afolabi & Partners (1963), Agbim & Partners (1965), Adejumo & Partners (1966), Chris Fajemirokun & Associates (1967), Civ-Struct Associates (1968), Osot Associates (1968) and Finco Engineers (1969).

Manufacturing had also already started to take roots in Nigeria in the sixties. The Western Regional Government had created the Ikeja Industrial Estate just to the north of Lagos. The nation also had a few entrepreneurs as reported in the two cases below:

> *Denchukwu Ltd at Isieke Ibeku near Enugu employed about 300 workers in various activities in 1963. The proprietor, who had attended secondary school and developed an interest in science subjects, opened a quarry to supply limestone to foreign construction firms. Soon after, he opened a second quarry to supply granite for a port extension project. Learning that Shell-BP was spending $3,000 daily to import drilling mud, he began to search for a local substitute. He found a satisfactory local clay and with Shell's assistance developed a satisfactory product, the bulk of which was sold to Shell from 1961. After experimentation, he also set up in 1963 a small emulsion paint factory whose product was recommended for use by government departments. He also developed a fertiliser which he supplied to the Ministry of Agriculture and a face powder.*

Chief A S Guobadia established his own electronics company, Maiden Electronics in the mid-1960s. Assembly of TV and radio started in 1968 and later the manufacture of some components.

Highlight of engineering works in the 1960s include establishment of the Ewekoro Cement Factory, the UAC Motor Assembly Plant, the Nigerian Ports Authority (NPA) workshops, EPE boat yard, and the construction of the Baro-Kano Railway. Others included the 26-storey Cocoa House in Ibadan, the Niger Bridge linking Onitsha and Asaba, the Kainji Dam, Development of North West Lagos (Surulere), the National Stadium, Lagos Ring Road and Eko Bridge, among others.

The need for the training of local personnel, if not to design and construct facilities, then at least to operate and maintain them was very well recognised. Some of these projects therefore included elaborate training content. The case of the Kainji Dam illustrates this practice.

> *Kainji Dam (1964 – 68) with generating capacity for 960 Megawatts of power was expected to significantly solve the energy shortage problem in Nigeria. In 1967 the Nigerian and Canadian governments signed a contract agreement whereby a team of 16 Canadians led by R.D. Nervison, Operations Manager, was sent from the Ontario Hydro-Electric Power Commission to help operate the Kainji Dam Power Plant and concurrently train Nigerians to take over the operation and maintenance of the Plant. On its arrival, the team recruited 15 engineers, 11 technologists and 94 technicians, all Nigerians and began to give them appropriate "on the job" training in April 1968. The Nigerian team wasted no time in acquiring the necessary skills and expertise. (Daily Sketch Aug. 1970)*
>
> *By August 1970, Nigerian Engineers, Technologists and Technicians had virtually taken over the maintenance and operation of the Kainji Dam Hydro-Electric Power Station and the associated transmission system from the team of Canadian engineers, technologist and technicians who had been operating the system.*
>
> *During the months of September and October 1968 the team carried out the installation of the Switch-gear at Oshogbo substation on the National Grid transmission system. Subsequently, on December 22nd 1968, the Kainji Power Plant began delivering electricity to Lagos and other places on the National Grid system. By the time the training programme was completed in July 1971, responsibility for the operation and maintenance of the Kainji Dam and the 330KV transmission system rested squarely on the shoulders of the Nigerian staff (Daily Sketch Aug. 1970).*
>
> *The Canadian example illustrated, at least in the short run, the possible advantages of foreign technical assistances as a strategy for technological transfer. However, when this became tied in with what goes by the title of contractor-financing, it encouraged the tendency of the contractor-financier to want to assume disproportionate control, with attendant results of inflated costs. A job which at that time could have been completed with one quarter million pounds was easily presented as a half million pounds project. Once established with one contractor-project, argued Obembe (1968), the contractor could stretch his tentacles to other jobs or financing which the owner might in fact have had available resources ready to hand. This period witnessed some transfer of technology to the Nigerians.*

Nigeria inherited a few research institutes from the departing British administration. Most of them were, however, in the field of agriculture, reflecting the focus on raw materials for British factories. The only engineering-related research institute found on records for the sixties is the Federal Institute of Industrial Research, Oshodi, FIIRO. The conception of the Institute was in 1953, when the Word Bank sent an economic mission to Nigeria. One of the Missions' observations was that industrial research in Nigeria was diffused, uncoordinated, and with no definite direction. Consequently, the mission recommended that an "Institute of Applied Technical Research" be set up. It was inaugurated in 1956 by the then Minister for Commerce and Industry. In February 1958, the name was changed to "Federal Institute of Industrial Research."

Engineers and the Civil War

Professionals, particularly doctors and engineers are always inevitably major participants in wars. The doctors treat the injured while engineers provide the critical infrastructures both for the war and for rehabilitation after the war. The civil war provided such opportunities for Nigerian engineers.

On both sides of the war, engineers were called upon to maintain essential services. C.S.O. Akande recalls the role he and his staff and

colleagues, Engr. J.I. Akinde in Ijebu Ode, and Engr. Ife Akintunde in Akure, played in 1966 when he was Chief Civil Engineer and in 1967 Controller of Works and Principal Technical Adviser to the defunct Western Region Government. Peter Pugh and Ade-Ajayi (1990) comment on his involvement in war activities, including "the blowing up of bridges to halt the invasion of the Biafran armies" from the mid-West as follows:

> *This involved blowing up of critical bridges on both Ijebu-Ode and Ondo sides of Ore; as well as timber bridges on the minor roads in the forest reserve that could be used as alternative access. Akintunde recalls blowing up a bailey bridge on River Osse at Igbatoro in Owo Local Government area at a time when the Biafran forces were within a kilometre of the bridge. The Ministry was also later involved in providing bailey bridges as temporary replacements for the demolished bridges.*

Since war inevitably leads to physical destruction of engineering structures, it was a sad irony that engineers were called upon to destroy what they had helped to build. The then newly completed £6.5 million Niger Bridge had to be rendered unusable. Thus, Nigerian "civil" engineers became "military" engineers, showing that the dichotomy is not real, especially in terms of the experience of applied technology for war purposes. However, much of the engineering input into the war was handled by the Nigerian Army Engineering Corps on the Nigerian side. Achievements included the building of a 70-feet clear span bailey bridge with the assistance of the staff of the Ibadan Ministry of Works and Transport when traffic on the vital Lagos-Ikorodu road was disrupted.

On the Biafran side however, there was little distinction between civilian and military engineers. Indeed the whole populace could be said to have been drafted into the military. In the manufacture of weapons, electrical engineers and chemists, working at the Products Development Agency (PRODA), made mortar bombs, land mines, anti-aircraft rockets capable of flying some 2 km, hand grenades like the famous "Ogbunigwe", and the armoured vehicle "Genocide" which were built in Port Harcourt. Civil engineers built the Uli airstrip within four weeks, with an air traffic control on wheels. The air strip handled heavy air traffic on a daily basis, with over 90 per cent of the traffic at night. Civil engineers also built a three-mile pipeline from Egbema oil field to the outskirts of Oguta wading through floods.

According to Okigbo, "They (Engineers) succeeded in building out of entirely locally fabricated materials a giant petroleum refining facility and thereby made the technology so diffuse and more universally understood and applied than anywhere else in the world".

Other wartime engineering feats included the building of a fish pond within six months at Umudike-Umuhia and the building of five underground mass concrete fuel tanks with a total capacity of over 5,000,000 gallons. All these war efforts were in addition to maintaining the supply of water and electricity, traffic on the railway, and the sustenance of the broadcasting services by engineers.

The COREN Decree

A major achievement of the decade is the move towards the enactment of a decree to regulate engineering practice in Nigeria. The counter coup of July 1966 brought Lt. Col. Yakubu Gowon into power, and he was to lead the country from July 1966 to February 1975. His Commissioner for Works and Housing was a young and popular Lagos lawyer, Lateef Olufemi Okunnu, popularly called Femi Okunnu, who facilitated the promulgation of the COREN Decree No 52 of 1970.

Femi Okunnu had attended King's College, Lagos, the University of London, Gray's Inn, London and called to the English and Nigerian bars in 1960. As a young man in London, he had been quite active and vocal on national and international issues. On return to Nigeria, he started his law firm and continued to write articles and comment on contemporary issues. He was already aggrieved about the situation within the legal practice in which about ten foreign-owned legal firms controlled over 90% of the legal retainer-ship in the country. At the annual bar conference in Kaduna in 1966, he had tried to move a motion restricting legal practice in Nigeria to indigenes without success.

This was the mindset with which the commissioner assumed duties. He was set to empower Nigerian professionals by giving them the charter to practice their profession. According to Okunnu:

> *"I chose the professions of architecture and engineering to test the grounds. I invited Arc. Olu Olumuyiwa, the then president of the Nigerian Institute of Architects to my house to find out his reaction. He was most enthusiastic. I had similar discussions with Engr Kanyi and he enthused in the same way. I received the executives*

committees of the two institutions separately and offered them what I could not offer my colleagues at the Bar. With the backing of the two committees and the support of the professional heads in the ministry, Engr S. B. Audifferen, the Director of Federal Public Works and Arc Augustine Egbor, the Director of Buildings, and with the active support of the Permanent Secretary and Director General, Engr. S. O. William, with a first class degree in Engineering from a Scottish University, and for some years AAA of England champion in long jump, - with all that support – I set to work. The two institutions formally sent in their proposals. The drafting instructions to the Federal Ministry of Justice for the drafting of the necessary legislation (decree) were duly sent to the ministry. With the draft in hand, a council memorandum was prepared in 1968."

Mr Okunnu was to present the memoranda for the Architects Registration Council, ARCON, and the Council for the Registration of Engineers in Nigeria, COREN to the federal cabinet. The Nigerian Society of Chemical Engineers, however, sent a delegation to the Honourable Commissioner to complain that they were 'a different breed' from the main stream engineers. He referred them to the Nigerian Society of Engineers for a resolution and held back the COREN memo. Only the ARCON memo was therefore presented and this was passed and later promulgated as Decree No 10 of 1969.

The Chemical Engineers could not reach agreement with the Nigerian Society of Engineers even after the ARCON Decree. The Honourable Commissioner then consulted with the top executives of the Ministry and the Nigerian Society of Engineers and went ahead to present the memorandum to cabinet, expecting unanimous approval as had happened with the ARCON memo. In the words of Mr. Okunnu:

"This was not to be. Unknown to me, some expatriates had lobbied hard among some of my colleagues. Words had passed round that Section 1 of the decree which reads thus:

'Subject to the provision of this decree, a person shall not practice the profession of engineering unless he is a Nigerian citizen and registered under the decree'

"would create an exodus of expatriates in the construction industry as section 1 was obviously discriminatory. I pointed out that there was provision for reciprocity in the decree as in similar legislations governing other professions. The same words were contained in Section 1 of the ARCON Decree (now Act) which received very easy passage in Council. Instead of facing an obvious defeat on the delicate issue, though false and unfounded, I withdrew my memorandum."

Disappointed but undaunted, he removed the offensive Section 1, re-drafted the memorandum and presented it to the cabinet (Federal Executive Council, FEC) at a later date.

"It passed through FEC with little debate. Though fears were again expressed that if expatriates are denied registration on the grounds that were not Nigerians, difficulties might arise about finding qualified engineers to perform essential duties in those parts of the country where some Nigerians were reluctant to take up appointments. The FEC nonetheless 'agreed that the decree should be promulgated without further reference to Council'

Thus the Engineers (Registration, etc) Decree 1970 or Decree No 55 of 1970 came into force on the 5th of December 1970.

The Decree established the Council and charged it, among other things, with the duty of:

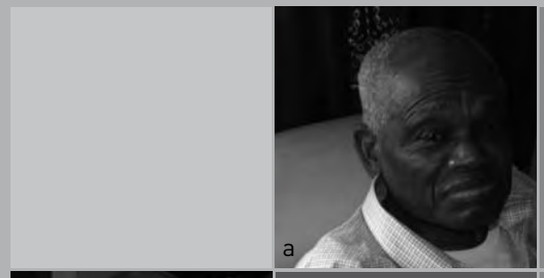
- determining who are engineers,
- determining what standard of knowledge and skills are to be attained by persons seeking to become registered as engineers;
- securing the establishment and maintenance of a register of persons entitled to practice as registered engineers;
- regulating and controlling the practice of the engineering profession in Nigeria in all its aspects and ramifications.

The decree envisaged a council of 23 members, 8 to be appointed by the federal government, to represent all "interests in the field of engineering", 6 from the states in rotation, 3 from the universities, and 6 elected by the NSE. Thus, although the NSE nominees were in a minority, there is no doubt that the Council was meant to be strongly influenced by them. No one can be a member of the Council who is not a Registered Nigerian Engineer. While non-Nigerians are not explicitly prohibited from registering as engineers, the decree provided for temporary registration for foreigners with qualifications approved

by the Council for the duration of their specific employment in Nigeria. The decree made it illegal for anyone not so registered to practice as or claim to be a professional engineer.

Many members of the NSE hailed the decree as a charter of independence. There was now less need to seek membership of foreign Institutions of Engineers. Registration with COREN became vital to the professional status of the Nigerian engineer. This had a very positive effect on NSE since membership of NSE led naturally to registration with COREN, and in fact anyone seeking registration as an engineer should belong to a professional body of engineers. If anyone had any doubts about it before, active participation in the life of NSE, like registration with COREN, had become essential for the professional career of the Nigerian engineer. This made it easier for NSE to maintain discipline on their members and, for example, financial regulation hitherto relaxed, could be tightened up. As Teju Oyeleye said in an address to the Ibadan branch in February 1971, the decree was the most important thing to have happened to NSE since its inception: it marked, above all, the final step in the recognition of the society by the Nigerian polity.

Perhaps because the engineers had the charter on a silver platter and did not have to fight hard for it, the objectives of this charter have not been rigorously pursued. COREN has not exercised its powers in preventing many foreigners from coming to the country and describing themselves as engineers in order to circumvent the Expatriate Quota Law, which prevents any company working in Nigeria from bringing any foreigner to do work which any Nigerian can do. The law also made it mandatory for any company bringing a foreigner to work in the country to train Nigerians to take over from the foreigner within a specified time. The neglect of this law has hindered the acquisition of practical experience within the country by our indigenous engineers as well as their unemployment and most importantly, under-employment.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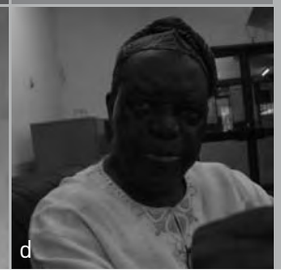
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CHAPTER 4

THE BIRTH OF ACEN

Images a – g: Signatories to ACEN's original article and memorandum of association;
a. Adenrele Adejumo
b. FAO Phillips
c. FA Shonubi
d. Iyiola Omisore
e. Obi Obembe
f. VO Oyefodunrin
g. Goke Bamgbopa

Not in picture:
Chris Fajemirokun

Image above: ACEN Logo

CHAPTER 4

THE BIRTH OF ACEN

In spite of the poor treatment meted out to early engineers by the expatriates and the society at large, interest in engineering by young people did not diminish. In fact it continued to increase and by the end of the sixties, engineering was as popular as medicine among science students in secondary schools. The increase in tertiary institutions from four in 1960 to twenty by 1970 provided ample opportunities for students to study engineering. The major oil company in the country gave scholarships to students to study both at home and abroad. The federal government, the commonwealth and foreign governments all made scholarships available to students. Engineering education was thriving by the beginning of the seventies.

With the end of the war, there were increased opportunities for engineers to practice their profession. Much rehabilitation needed to be done, and there was money to do it. The Nigerian Society of Engineers continued to provide the platform for engineers to network and address engineering issues.

Possibly the most significant factor at the beginning of the seventies, however, was the awareness created by the COREN Decree, and the opportunity that it provided for the indigenous engineers. Not only did the then Commissioner for Works and Housing, Lateef Okunnu, singularly drive the promulgation of the decree, he also believed in its enforcement. He encouraged the use of local engineers and other professionals as much as he could. In particular, he encouraged the strengthening of the Direct Labour Unit of the Ministry of Works and got them to design the Federal Secretariat at Ikoyi, the Ministry of External Affairs at the Marina, and the Federal Government Block of Flats for public officers on Eric Moore Road.

With the decree in place and engineering opportunities available, engineers in government resigned their appointment to start their own businesses, mostly consulting engineering firms.

To understand the role of consulting engineers, it is necessary to look at the life cycle for the production and use of engineering products. In this life cycle, engineers perform different roles that all culminate in producing and ensuring the functionality of the product. These roles may be classified into four broad groups and include the research engineer, the consulting engineer, the production or construction engineer, and the facilities manager or maintenance engineer.

The life cycle of the production of things starts with the knowledge of science, and its application in the laboratory environment to see what practical use such scientific knowledge could be put to meet some specific human needs. Engineers in this area of work are known as research engineers and are to be found in schools of engineering and research institutes all over the world. The difference between the engineer and the scientist in this area is that while the scientist focuses on science in its pure form, the engineer is interested in the practical use to which scientific findings may be applied.

A good example is the establishment of the power contained in the atom. Einstein, in deriving his famous equation E = mc2, was the classical scientist. The practical release of this energy in the atomic bomb or the conversion of such energy to nuclear power is the preoccupation of the engineer. Before this could be done on a life scale, however, the research engineer had to work in the laboratory to achieve the objectives at a laboratory scale and probably at a larger scale usually referred to as a pilot scale. Such research focused engineers usually serve as advisers to the industry engineers, especially in newly evolving areas.

Once the engineering process for making things is established, the design engineers learn the practical process of making such things. This requires that they understand the scientific basis of the process, as well as the practical considerations for their designs. The engineers who focus on the preparation of designs and specifications of engineering works are usually referred to as consulting engineers. Their primary objective is to convert scientific knowledge and know-how to goods, infrastructures and services that add value to peoples' lives through design and specifications. The output of consulting engineering practice includes design drawings and specifications, and frequently they supervise the production of such works to ensure compliance.

The next stage in the production life cycle is that of manufacturing or construction of the product. Several engineers are engaged in construction, manufacturing and production centres all over the world producing goods, infrastructures and services that maintain and continuously improve our quality of life. The products of these processes derive from the application of some scientific knowledge by research engineers. Thereafter, they are designed and specified by the consulting engineers. Then they are manufactured by the engineers in the area of manufacturing. In this fundamental sense, construction and

manufacturing may be used interchangeably. Both of them are trying to produce the outcomes of the design process.

Upon completion of the production of the desired goods, infrastructures or services, they go into use by the public for their intended purposes – to satisfy some human needs, desires or indulgencies. Even in this phase of the life cycle, the engineer is still required to ensure that they functions as designed and manufactured. Depending on the complexity of the product, full time maintenance engineers may be required to ensure this. For simpler products, however, some form of periodic maintenance is usually adequate. There is thus, the maintenance engineer who either works full time on the facility, or runs a maintenance workshop to provide these services.

The processes described above use knowledge, materials and labour to produce goods and services for the individual and the community. In doing this, they not only produce the goods, infrastructures and services, they provide employment, promote trade, facilitate communication and networking and maintain our quality of life. They provide the basis for economic development which is rooted in the principles of production. They also provide the goods and infrastructures for social development including schools, stadiums, hospitals, drugs and equipment. Simply put, engineering ensures economic and social development.

The Consulting Engineering sub-sector is thus part of the global engineering industry, which is in itself the engine of economic and social development. The scope of work of this sub-sector is very broad as it cuts across all engineering disciplines, and can be found in a wide variety of engineering industries. All engineering products, infrastructures and services go through the process of conceptualisation, feasibility, preliminary and detailed design, construction, fabrication or manufacturing, commissioning, operations and maintenance. In this process, they pass through all the phases of the practice of engineering described above. The consulting engineer is usually involved in concept development, feasibility, design, supervision, project management, commissioning, operations management and facilities management. He may also provide professional services directly to contracting and manufacturing firms for the management and improvement of their organisations.

While the consulting engineer may be found in all engineering industries, there is a sub-set of the sub-sector whose practitioners are predominantly engaged in consulting engineering practice. They are generally privately owned and run and provide independent advice and services to clients. When such organisations are owned by government, or are a department of multi-disciplinary organisations with different primary objectives, they are usually not classified as consulting engineering practices, even though they do mostly the same types of activities. The main difference is the independent role of consulting engineering practices, as compared with the dependent roles of departments of companies and agencies of government.

This story is about those who chose to run consulting engineering practices. Between the late sixties and mid-seventies, at least fifty consulting engineering firms were registered and were thriving in the country. Being private companies, they definitely shared common interests and challenges, not least of which are remuneration for work done and standards for practitioners to ensure quality.

The Founders

A few of the new practitioners got together sometime in 1971 to form an association for the newly emerging sub-sector. From the records we were able to review and interview of older members of the profession, about twelve people were involved in the formation of this association. These were not men who were struggling to survive, but mostly men who had proved their mettle in previous pre-occupations. They were experienced, confident and competent professionals mostly in their forties. They had resources and society presence to make it happen, and this is what they did.

The leader of the team was F. A. O. Phillips who had just the previous year retired as the General Manager of Nigerian Railways after 35 years of meritorious service. Engr. Phillips had, right from his secondary school days at King's College Lagos, wanted to be an engineer. He, therefore, sought training with the Railways and was employed as a special course apprentice in 1935. There, he went through a 6 ½ year apprenticeship and correspondence courses with the British Institute of Technology supplemented with courses at the Yaba Higher College. He passed Section A of the Associate Membership of the Institute of Mechanical Engineers in October 1937, Section B in 1939 and Section C in October 1941. He became a Graduate Member of the Institute in 1943,

an Associate Member in 1948 and a Fellow in 1958. F. A. O. Phillips spent 35 years in the Railways and rose to the position of Chief Executive of the organisation from 1966 to 1970 when he voluntarily retired. Upon retirement, he formed the firm of F. A. O. Phillips and Associates

The post-independence period had already started producing Nigerian engineers and engineering firms. The first of them on record was Obi Obembe and Partners, founded in 1958 by Mr. George Obimakinde Obembe. Engr Obembe had his secondary education at Government College Ibadan, obtained his first degree from the McGill University, Montreal, Canada in 1950, and his Masters degree from the University of Toronto. On return to Nigeria in the mid-fifties, he took up the position of Assistant Chief Engineer in the Public Works Department, PWD, of the old Western Region of Nigeria in 1956. In 1958, he resigned his appointment to establish the first indigenous engineering consulting firm in Nigeria, Obi Obembe & Associates in Lagos.

Victor Olatunde Oyefodunrin attended Government College, Ibadan from 1948 to 1952, and taught at Molusi College, Ijebu Igbo. He later proceeded to the Ahmadu Bello University, Zaria (then a college of the University of London) where he read Mechanical Engineering and graduated in 1962. He worked in the Ministry of Works and Housing as a Design Engineer in Mechanical Services from 1962 to 1969 and then as a lecturer in hydraulics at the College of Technology, Yaba from 1970 to 72. He co-founded the UNECON, a firm of mechanical and electrical consultants in 1972 with A. O. Soyanwo and Dr. S. A. Akinleye as partners

Adenrele Adejumo was born in 1929 and had his primary school at the St Paul Primary School, Breadfruit, Lagos and his secondary school at the CMS Grammar School, Bariga. He enrolled at Leicester College of Science and Technology where he obtained a diploma in engineering in 1952. He commenced his degree course at the University of London in 1953 and graduated in 1957. He worked with the Lagos Executive Development Board, LEDB from 1959 to 1966. He started practicing as a consulting engineer in 1966, but took time to study Naval Architecture during the war years.

Folasodun Adebisi Shonubi was born in 1935. He attended Government College, Ibadan from 1949 to 1954 and University College, Ibadan from 1954 to 1956. He proceeded to the Queen's University of Belfast in 1956 where he obtained his bachelor's degree in mechanical engineering in 1959, and his doctorate degree in 1964. In between, from 1959 to 1961, he obtained a master's in production engineering and DIC from Imperial College, London. On his return to Nigeria in 1964, he joined the Faculty of Engineering of University of Lagos and became a senior lecturer and Acting Head of Department in 1968. He left the University in 1973 to become the Principal Partner of Mek-Ind Associates, a firm of consulting engineers.

Titus Olagoke Akanni Bamgbopa was born in 1932. He had his secondary education at Igbobi College, Lagos and worked with the Lagos Town Council before proceeding to England. He studied Structural Engineering at the Hammersmith School of Arts and Building from 1957 to 61. He then worked with Ian Fraser & Associates, a firm of Architects and Consulting Engineers in London where he obtained his MIStructE, the full corporate membership qualification of the Institute in 1963. He returned to Nigeria in 1965 and worked with Obi Obembe and Partners. He resigned from paid employment in 1968 to found Civ-Struct Associates.

Chris Fajemirokun graduated in 1960 from London University. He worked with Johnson and Phillips in the United Kingdom, and then in Norway and Sweden from January 1961 to December 1962. He returned to Nigeria in 1963 and worked with the Electricity Corporation of Nigeria, ECN, the precursor to the National Electrical Power Authority, NEPA, and Power Holding Company of Nigeria, PHCN. He worked with Top Breweries from 1964 to 1967, rising to the position of Chief Engineer. He resigned in 1967 to form an electrical and mechanical engineering consulting firm, Chris Fajemirokun and Associates.

Iyiola Omisore was born in 1929 and attended Oduduwa College, Ile Ife. He went to England in 1953 and enrolled at Hammersmith School of Building and obtained his MIStructE in the late 1950s. He worked with Edward Wood & Partners and Andrew Kent & Stone before returning to Nigeria in 1959. On his return, he joined the Western Region Ministry of Works as the first structural engineer. He resigned soon after and joined the architectural firm, Design Group as the in-house structural engineer. He resigned to form his own firm, Iyi Omisore & Associates in 1962 when the regulation changed to limit architectural firms to architectural practice only. Due to increased volume of work, he invited his friend and colleague, Alhaji S. A. Afolabi, to join him in 1963 and the firm's name was changed to Omisore Afolabi and Partners.

Other engineers whose names are on the original Articles and Memorandum of the association but were not able to sign the document include Dr Babajide and Sam Okonkwo. The draft document had been produced in 1973. By the time of formal registration in 1978, Dr Babajide could not be found and his name was removed from the register of members. Sam Okonkwo had taken ill and was thus not available to sign the document.

These were the first signatories to the first Memorandum and Articles of Association of the Association of Consulting Engineers Nigeria

The list of forty-seven members sent to FIDIC as part of the application for membership in 1976 is shown in Table 1

Formation and Registration

According to Engr. Goke Bamgbopa, the first attempt to form an association was that of the Association of Consultants, an association that cut across all disciplines in the construction and building industry and included architects, engineers, quantity surveyors and town planners. The new professional consultants used to meet at the house of Arc Olumuyiwa, the first Nigerian architect. Not much progress was made with this association and it was never registered.

F. A. O. Phillips retired as General Manager of the Railway Corporation of Nigeria in 1970 and registered a consulting engineering firm. He was to provide a focus for the engineering subgroup which led to the founding of ACEN.

The first meeting for the formation of the association was held at the Island Club on the 7th of August 1971 with 12 Engineers in attendance. Mr. F. A. O. Phillips and late Mr. A. O. Beckley were by consensus appointed Ad Hoc Chairman and Secretary respectively. At the next meeting held on the 9th of October 1971, Mr. Beckley had taken ill and Mr. Oyefodunrin started to act as Secretary.

At the meeting held on Saturday 19th April 1972, the Memorandum of Article of the Association was ratified and the incorporation processes was started. Unfortunately, due to circumstances beyond our control including protests by some organization such as Nigerian Technological Engineers, formal approval could not be obtained from the Ministry of Trade until 1979.

Table 1 List of ACEN Members at Registration with FIDIC

1 Mr. J. N. Rutherford	Ove Arup & Partners	Civ/Struct/Highway
2 Brigadier G. C. S. Nantanaco	Allistair McGowon Associates	Civ/Struct
3 Dr. C. C. Agbim	Agbim & Partners	Civ/Struct
4 Mr. E. O. Phillips	Philfag Engineering Company	Civ/Struct
5 Mr. A. O. Olufawo	Abayomi Olufawo & Partners, Ibadan	Civ/Struct
6 Mr. C. L. M. Fajemirokun	Chris Fajemirokun Associates	Electrical
7 Mr. E. I. Omisore	Omisore Afolabi & Partners	Structures
8 Mr. S. A. Afolabi	Ditto	
9 Mr. T. O. A. Bamgbopa	Civ-Struct Associates	Civ/Struct
10 Mr. S. A. Olowu	Ditto	
11 Mr. S. O. Oke	Ditto	
12 Dr. A. B. O.Soboyejo	Soboyejo Associates	Mech/Civ/Struct/Sanitary
13 Mr. J. A. Ademuyiwa	Cordial Construction Company, Ibadan	Civ/Struct
14 Mrs. J. O. Maduka	Leccom Associates, Ibadan	Elect/Telecoms
15 Mr. Orofo Asika	Asika Partners, Enugu	Civ/Struct
16 Mr. I. A. Ososami	Civcon Associates, Zaria	Civ/Struct/Sanitary
17 Mr. Debo Tade	Tacas Associates	Electrical
18 Mr. Ademola Fowora	Ademola Fowora Associates	Electrical
19 Dr. Kayode Segun	Osot Associates, Ibadan	Civ/Struct
20 Mr. Olumide	Ditto	
21 Mr. A. Tokun	Ditto	
22 Mr. Olaniyan	Olaniyan, Omotosho, Santos Associates	Civ/Struct
23 Mr. Santos	Ditto	
24 Mr. Omotosho	Ditto	
25 Mr. S. O. Fadahunsi	Comprehensive Engineering Consultants	Civ/Struct
26 Mr. O. Soyanwo	Unecon Associates	Elec/Mech/Sanitary
27 Mr. Seth Nwanagu	Associated Consultants & Research Eng	Elec/Mech
28 Dr. Alaba Akinsete	Finco Engineers	Elec/Mech
29 Mr. O. Ogunsola	Adejumo Ogunsola & Partners	Civ/Struct
30 Mr. A. Adejumo	Ditto	
31 Dr. F. A. Sonubi	Mek-Ind Associates	Mech/Elec
32 Mr. Tunde Oyefodunrin	Unecon Associates	Mech/Elec/Sanitary
33 Mr. F. A. O. Phillips	F. A. O. Phillips & Associates	Mech/Elec/Struct
34 Mr. Obi Obembe	Obi-Obembe & Associates	Civ/Struct
35 Mr. S. E. Okonkwo	Enplan Group	Civ/Struct
36 Mr. N. Sulaiman	N. Sulaiman & Partners	Civ/Struct
37 Mr. S. M. A. Aderemi	Engineers Collaborative	Civ/Struct
38 Mr. Olubunmi Beckley	Olubunmi Beckley & Associates	Civ/Highway
39 Mr. Lanre Falase	Lanre Falase & Associates, Ibadan	Civ/Struct
40 Mr. Adeyemi	Davies Adeyemi & Associates	Civ/Sanitary
41 Mr. Etteh	Etteh Aro & Partners, Ibadan	Civ/Struct
42 Mr. Wale Adekoya	Leecon Associates	Structures
43 Mr. L. Shoyinka	Urban Engineers Consultants	Civ/Struct
44 Mr. Penrose Johnson	Penrose Johnson Associates	Civ/Struct
45 Mr. M. O. Adesina	Sshwed Associates, Ibadan	Civ/Struct/Sanitary
46 Mr. O. O. Oshinowo	Ditto	
47 Mr. O. Adedeji	Ditto	

The first members of the Council of the Association elected on the 19th of August 1972 were: Mr. Phillips, Mr. Oyefodunrin - (Mechanical Engineers), Mr. Adejumo, Mr. Obi-Obembe, Mr. Bamgbopa, Mr. Okonkwo, Mr. Omisore - Civil / Structural Engineers, Mr.Fajemirokun - Electrical Engineer, Dr. Babajide - Chemical Engineer.

In February 1973, a copy of the draft Memorandum and Articles of the Association drafted in line with that of the UK association was sent to Dr. Arthur Nylander, a lawyer and friend of Engr. F. A. O. Phillips for review. A formal one was later prepared and the incorporation process was started. At its first meeting after inauguration of the Council held on 3rd February, 1973, Mr. Phillips was appointed chairman of the council, Mr. Oyefodunrin - honorary secretary and Dr. Babajide, treasurer.

While waiting for statutory registration, the association continued to hold meetings and regular activities. The first of such major activity was the preparation of Conditions of Engagement and Scale of Fees for Engineering Consultancy which was prepared between 1973 and 1975 and was endorsed by the Nigerian Society of Engineers, COREN and eventually by the Federal Government as the official scale of fees for federal government projects.

Members were also introduced to the International Federation of Consulting Engineers, FIDIC and started attending the conference. ACEN subsequently applied for full membership of FIDIC and was elected in 1977.

The Association also tried to resolve all the outstanding issues delaying statutory registration. On the 13th of May 1978 Dr. Arthur Nylander forwarded, on behalf of the Association, an application for Registration of the Association together with a copy of the Memorandum and Articles of Association to the Federal Ministry of Trade, Companies Affairs Division. After obtaining COREN approval, the Certificate of Incorporation No RC28471 dated 12th June 1979, under the Company Decree 1968, Limited by Guarantee (not having a share capital) was issued.

The fundamental principles on which the Association was founded and would be run were Independence, Qualification and Professional Ethics

The principle of independence implies that consulting engineers' professional advice, judgment or decision must not be influenced in any way by a connection with another person or organization. The remuneration of a consulting engineer for professional services should be derived only from fees paid by clients with the exception that a consulting engineer may nevertheless also benefit from equity participation in ad hoc groups formed with others to undertake design and construct, project management or similar activities.

This principle was established very early in the practice of consulting engineering. The industrial revolution in England brought about the introduction of very many new technical products into the market. The consumers, both private and government, did not understand most of these products and therefore could not evaluate them. They could also not distinguish between the manufactures who were only marketing their products, the salesmen who were selling products they did not necessarily understand, and informed opinion of the trained engineers.

In the midst of these, the trained engineers came together and sought to give professional advice to the public. In doing so, they undertook not to be affiliated to any manufacturer or supplier, but to provide independent opinion of the products being evaluated. Hence the principle of independence became engrained in consulting engineering services.

In the consulting engineering industry of the 1970s, this translated not only as independence from manufacturers and marketing companies, it took the form of independent advice to governments especially on infrastructures. While government agencies could carry out designs, supervision and management of infrastructure works, they were considered not independent as they could be instructed by their non professional engineer superiors. Similarly, design works carried out by research institutes owned by governments and contracting firms were not considered as giving independent advice, neither were they considered to be deriving their income primarily from consulting engineering practice.

The associations then sought to establish minimum qualifications for their members so as to ensure competence. At this time, the focus was on the individual engineer rather than his firm, and three basic criteria were stipulated. The first was that he had to be a university graduate with an engineering degree or a registered professional with an engineering institute. The second condition was that he had to be at least thirty three years of age and should have been in engineering practice for at least ten years.

Extracts on Qualification for Membership states

"No person shall be qualified for membership of the Association unless he

- Has been registered to practice as an Engineer in Nigeria by the Council of Registered Engineers of Nigeria
- Is a member of an Engineering Institution or Society recognized by the Association
- Is at least 33years of age and
- Has had at least 10 years post-qualification experience including the design and supervision of important engineering works and must have been successfully conducting his own practice or be a partner or consultant in firms of consulting engineers of good repute."

It is clear from the conditions for membership that the association mainly targeted senior engineers with design as their primary means of livelihood. The Nigerian Society of Engineers, on the other hand, had provisions for all cadres of engineering graduates, from student membership to graduate and finally full membership of the association. NSE was also open to all practicing engineers irrespective of the area of practice, from consulting to civil service, manufacturing and contracting, teaching and research. The duration of supervised experience to be admitted into NSE was a minimum of two years only. Admission into membership of the Nigerian Society of Engineers also eased registration with COREN, which required only four years experience. NSE was therefore much more popular with younger engineers and ACEN was not well known among them in the seventies.

With the senior engineers, however, it was immensely popular. A 1982 directory showed that it had 154 engineers representing about a hundred consulting firms in its membership. These were mostly senior engineers in their second or third careers who had taken the opportunity of the COREN Decree to form consulting firms. ACEN did not need to advertise or promote itself among young engineers at formation, as it already had a captive senior engineer core. This was later to impact negatively on the association as the senior engineers retired.

ACEN Articles and Memorandum of Association provided for a Council and an Executive Committee of Council to run the affairs of the association. It also provided for a chairman, a honorary secretary and a treasurer to lead the association. The first chairman, F. A. O. Phillips provided the venue for the first secretariat of the association, with meetings taking place in his office at 22 Ogunlana Drive, Surulere.

CHAPTER 5

THE BOOMING SEVENTIES

Images a, c – j: Some of the active consulting engineers in Nigeria in the 80s

Image b: Adeoye Fowora
Director of Civil Engineering at the Nigerian Ports Authority and a major player in the development of ports Nigeria, Awarded National Honour

Image above: Offshore Oil Rig, Nigeria

CHAPTER 5

THE BOOMING SEVENTIES

Two major factors influenced the 1970s for Nigeria. The first was the end of the civil war, which brought peace and re-unification. The second was the increase in both the quantity and price of crude oil produced by Nigeria, and the consequent considerable increase in revenue to the country. Suddenly, there were peace and plenty, two of the cardinal features of our old National Anthem.

The end of the civil war in January 1970 represented a welcome relief from the preceding thirty months of intense fighting. The return of peace presented the opportunity for reuniting the hitherto scattered population, including professional colleagues. Within the NSE, there was genuine happiness and anxiety to welcome back professional colleagues, and to be in the vanguard of the national movement for reconciliation. The society immediately wrote off all the war-times arrears of annual dues and subscriptions for members in the war-affected areas as a way of attracting them back to the fold.

Oil was discovered in Oloibiri in Eastern Nigeria in 1951, and exploitation of oil led by the Shell Petroleum Development Company was well advanced by the 1960s. But oil was yet to dominate the Nigerian economy at the start of this decade, and agriculture, mainly cocoa, palm products, groundnut and cotton, was still the mainstay of the economy. Three main groups of countries produce oil. The first consists of industrialised nations which produce oil mainly for local consumption, typified by the United States of America. The second consists of countries which produce oil mainly for export, to which Nigeria belongs. The third group have a mix of local consumption and export, the USSR and the UK being examples.

The United States although a major producer, also imported oil to subsidise its local production to meet its demand. It therefore had an interest in ensuring low price of oil, and did this by regulating its local production as necessary. From 1958 to 1970 oil prices were maintained through this means at about $3.00 per barrel. In real terms, however, the price of oil had declined. For the oil exporting countries, this decline represented loss of revenue when adjusted for inflation and the weakness of the US dollar in 1971 and 1972. Oil producing countries felt that they were not getting adequate value for their product and sought to influence this.

In March 1971 the Texas Railroad Commission, the regulating agency for American oil production, set local production at maximum capacity for the first time. This meant that the US could no longer determine the price of oil by varying its production. With no more spare capacity there was no other tool to put an upper limit on prices. Thus the ability of the United States to fix the price of oil ended.

The Organisation of Petroleum Exporting Countries, OPEC, was formed in 1960 with the five largest exporting countries, Iran, Iraq, Kuwait, Saudi Arabia and Venezuela as the founding members. By the end of 1971 six other nations, Qatar, Indonesia, Libya, United Arab Emirates, Algeria and Nigeria had joined the group: The founding members of the organisation had studied how the Texas Railroad Commission influenced the price of oil through the control of production. OPEC as a body could now, in a similar manner, control the production of oil in the international market and thus significantly influence its price.

The Israeli-Arab War started on October 5, 1973. The United States and many western countries showed support for Israel. In response, several Arab oil exporting countries imposed embargoes on these countries. The net effect of the embargo was a shortfall of 4 million barrels per day representing 7 percent of free world production of oil. Immediately the price of oil went up four-fold, from $3 to $12 per barrel in a period of just six months. OPEC had found its new strength, influencing oil price through the regulation of production.

This increase in oil price substantially increased revenue to Nigeria, and suddenly there was sufficient funding available to implement major projects.

National Development in the 70's

With the considerable increase in revenue, the federal government embarked on a massive development programme in virtually all sectors of the economy. Two five-year development plans 1970-75 and 1975-80 were conceived and implemented in this decade. The first plan was a rehabilitation and reconstruction plan, to restore the infrastructures that had been damaged during the war. The second plan was an ambitious plan to reposition Nigeria and Nigerians economically and socially. Most of the projects in the second plan were grand and hugely ambitious.

Two major projects in the steel and telecommunication sectors illustrate the scale of projects conceived and embarked upon in the period:

The country embarked on the simultaneous development of two major steel manufacturing plants, the Ajaokuta Steel Plant with the Soviet Union, and the Aladja Steel Plant with German and Austrian contractors. A paper by Dr Sanusi Alhaji Mohammed, the Secretary General of the African Iron and Steel Association summarises the efforts at establishing these plants:

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

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

Thus, in the 1970/1980 periods Nigeria embarked on two integrated steel development programmes. Unfortunately the Federal Government dissolved the NSDA; the only viable agency that could have scientifically managed the situation. Their functions were returned to the non-technical bureaucrats of a new Ministry of Steel. A lot of activities were then haphazardly embarked upon; lots of inflated subsidiary projects were being simultaneously chased.

In 1981, the Delta Steel Plant was completed and commissioned on schedule. On the contrary the Ajaokuta Plant became more complicated and remains uncompleted till today.

Two major development plans, 1970-75 and 1975-80 were prepared for the tele-communication sector in this decade. The 1970-75 plan concentrated on the reconstruction and rehabilitation of the equipment and infrastructures damaged during the war.

In telephony, new automatic exchanges were to be constructed and existing ones expanded. In telegraphic communication, the torn-tape system was to be replaced with the tele-printer automatic switching system. There were plans for the national transmission system and external line plant. The establishment of a Nigerian Satellite Communication earth station at Lanlate was also planned.

The third development plan was much more ambitious. In telephony, it aimed to increase the telephone facilities from 50,000 to 750,000. Three switching contracts of 162,000, 48,000 and 121,000 lines, and a mobile exchange with 11,300 lines were awarded to add over 340,000 lines to Nigeria's networks. In transmission, the plan considered the introduction of the Nigerian Domestic Satellite, DOMSAT, the Aerostat (Balloon) System, provision of coaxial cables from Lagos to Kaduna, and the expansion of the microwave radio link system.

G. O. Ajayi, R. I. Salawu and T. I. Raji gave an insight into achievements of the period:

"There were at least six achievements associated with the 1975-80 plan. First, 177 locations were provided with telephone exchanges as well as twenty-nine mobile exchanges, increasing the number of lines in the network from 52,000 to 241,000 and the number of telex lines from 874 to 4,950. Second, the DOMSAT earth station project was completed. Third, work started on the aerostat balloon. Fourth, a second satellite antenna was built at Lanlate, and this increased the global coverage of the external services. Fifth, an International Telephone Switching Centre (ITSC) was installed at the Nigerian External Communications (NECOM) House in Lagos. And finally, a new microwave link was provided between Lagos and Cotonou (Benin Republic) and computerized telex, telegraph, and data switching centres were provided at NECOM House."

Projects of similar scale were conceived in several other sectors, including the following:

- Several military barracks were designed and built to rehabilitate and settle soldiers returning from the war; the military projects alone needed 16 million tons of cement

- Port development was embarked upon to cope with the increased demand. Port Harcourt, Bonny, Calabar, Koko and Lagos ports were rehabilitated by1972. On October 14, 1977, the ultra-modern Tin Can Island Port was commissioned. About two years later (16th June, 1979) the new Warri Port was commissioned together with the new Calabar Port (19th June, 1979). The Apapa Port Complex was greatly expanded to include the addition of Roll-on Roll-off berths, in addition to several other ports along the national coastline.

- The few kilometres of single lane unpaved roads at independence in 1960 were replaced with more than 60,000 kilometres of paved roads out of which more than 2,000 kilometres have dual carriageways. Notable among them are the Lagos-Ibadan Expressway and the Sagamu-Benin Expressway. The quality and extent of the national road network received world acclaim and recognition as a result of which the International Road Federation produced a publication in 1982 entitled "Building Roads in Nigeria: An IRF Case History". Consequently, the Director of Federal Highways in 1982, Engr. Ifeanyi Osili, (now deceased) was honoured as the "Man of The Year" by the Federation.

- An ultra-modern terminal building was built for the Lagos Airport, with a second runway and other facilities and commissioned in 1979. Eleven additional airports were built in other parts of the country.

- About 5,000 kilometres of pipelines for transporting crude oil and petroleum products were built and linked to refineries capable of refining more than 400,000 barrels of crude oil daily at Port Harcourt and Kaduna and strategic storage depots.

- Nigeria hosted the Black and African Festival of Arts & Culture, FESTAC, in 1977. This involved the development of the National Arts Theatre, the FESTAC Housing Estate, the FESTAC Hotel and the Satellite Town in Lagos.

There were several others, including the Lagos Ring Road, Western Avenue, the Apapa-Oshodi Expressway and the Eko Bridge complex. The hosting of the All African Games, the commencement of the development of the new Federal Capital City of Abuja, the construction of the Egbin Power Station, the development of petrochemical plants and vehicle assembly plants were all embarked upon in this period.

The country had been divided into twelve states on the eve of the declaration of the Republic of Biafra, and some states also had very ambitious programmes. For example, under Governor Audu Bako of Kano State, the state embarked on a massive water development program through a dedicated government agency called Water Resources and Engineering Construction Agency, WRECA. Roads, housing and other infrastructures in Kano City were significantly improved. And this is not an exhaustive list of projects embarked upon.

Implementation Challenges

The magnitude of the plans embarked upon presented challenges and opportunities on all fronts – manpower, infrastructures, governance and institutional framework.

The congestion at the Apapa port perhaps best illustrates the inadequacy of the existing infrastructure to cope with development demands. In anticipation of the large quantity of cargo envisaged for the plan, Port Harcourt, Bonny, Calabar, Koko and Lagos ports were rehabilitated by1972. These, however, turned out to be grossly inadequate for the cargo that was eventually coming in. The situation was further compounded by the introduction of containerisation which brought heavier and larger volumes of cargo at a time. Not only were the ports inadequate to handle them, the country's narrow bridges and

poor road network constituted major hindrance to speedy evacuation of the goods. The containers had to be unpacked, thereby defeating the primary benefit of containerization. Rail services expected to handle about 50% of the traffic also responded poorly, handling below 25%. There was also the inefficiency and abuse of the port operations and processes. These all resulted in severe port congestion.

In addition to the volume of cargo generated by the aggressive developmental efforts, economic and social policies of government compounded the issue. Having frozen salaries for the war period, a salary review commission was set up with Chief Jerome Udoji as chairman. The commission recommended significant increases in salaries, with one year of arrears. This increased the purchasing power of the general populace for consumable goods phenomenally. The government also relaxed the foreign exchange control that had prevailed during the war and lifted the ban on imports. All these causes led to a massive demand for imports. At a point, the government ordered 20 million tonnes of cement, 16 million of which was to be used by the military, when the total existing port capacity in the country was 6.5 million tonnes of cargo.

Consequently, the Apapa Port was congested with vessels which arrived simultaneously within the nation's territorial waters. By the close of 1974/75 fiscal year, 105 ships, most of which were cement vessels were already queuing for berthing facilities. By the middle of 1975, vessels waiting for berthing spaces in the ports had reached a record figure of 455, which included 300 vessels carrying bags of cement. Ships had to wait for an average of 180 days before they could berth. This attracted a freight surcharge of 30 to 100%. A demurrage estimated at US$4,100 per day for each cement vessel for delay in excess of ten days was paid by the federal government.

The port congestion blocked the inflow of raw materials to industries and production slowed down just at the time when demand was highest. Even at their full production, it would have been difficult to cope with the increased demand. With more money in people's hands chasing insufficient goods, the situation was simply chaotic.

There were also the challenges of the competence and the capacity of the construction industry in the country to cope with the engineering demand of these projects. There was considerable inexperience in most of the government agencies responsible for these projects, and

the country was in a hurry. Rather than use the opportunity presented to develop a robust engineering industry, and indeed a strong economic base, the concentration was on the projects as ends in themselves.

There was clearly not enough engineering competence and capacity locally, and the whole international community enjoyed the boom period in Nigeria. Foreign consultants had a field day. In addition to consultants from the United Kingdom with whom Nigeria had historical relationship, consultants came from all over the world. Table 2 shows some of the major consultants with offices in Nigeria at this time.

Table 2 Some of the Foreign Consultants in Nigeria in the 1970s

Belgium	Verdeyen & Moenaert
	Societe De Traction Et D'electricite S. A.
Canada	Lavalin
	Reid Crowther
	Wardrop
	Consult Limited
Denmark	Nidanconsult
France	Ingeroute
	Etudes Techniques Et Economiques-De Routes, Aerodromes Et Transports
Germany	GKW
	Gauf Associates
	Oscar Von Miller
	Engineering Construction Company
	Dorsch Consult
	Rhein-Ruhr Ingenier-Gesellschaft Mbh
	Gollwitzer Ingenieurplanning & Co
Italy	C. Lotti & Associati
	IN.CO. S.P.A
	A Macchi-Vale & Ass
Israel	Tahal
	Nigerian Water Resources Development
	Engineering Services Limited
	Y Amit
Lebanon	Dar Al Handasah

Netherlands	Haskonning
	DHV
	Netherlands Engineering Consultants NEDECO
Sweden	BSB-International Consultants
Switzerland	Societe Generale Por L'Industrie
United Kingdom	Ove Arup
	Scott Wilson Kirkpatrick & Partners
	Oscar Faber
	T. P. O'Sullivan & Partners
	Ward Ashcroft and Packman
	Norman & Durban
	Howard Humphreys, Keeble & Partners
	P. A. B. Design Group
	P. A. International Management Consultants
	G. Maunsell & Partners
	Sir Alexander Gibbs & Partners
	Engeol Engineering Geology Consultants Ltd
	Peter Frenkel & Partners
	Coode & Partners
United States	Louis Berger
	Sverdrup & Parcel & Associates
	Tippetta-Abbett-McCarthy-Stratton
	Pacific Architects Engineers Inc.
	Alden E Stilach & Associates
	Palmer & Bajer Engineers
	Dave & Moore
	Gilbert Associates

Local consulting engineering firms also emerged to respond to the demand. As at December 1982, ACEN had over 150 engineers representing 100 companies on its register, from just about ten firms at the end of the war in 1970. Many engineers resigned from government service and the universities to form consulting firms. The graduates of local universities also formed their own firms. Led by the College of Arts and Science, Zaria, the graduates of University of Lagos and University of Nigeria Nsuka soon obtained COREN registration and were able to register consulting engineering firms. Even graduates of the early 70s had enough time to acquire experience, register with COREN and form their own firms within this period, and many did.

Some of the founders of ACEN, Obi Obembe, Adenrele Adejumo, Chris Fajemirokun, Iyiola Omisore and Goke Bamgbopa had established their consulting firms before the 70s. Firms established early in this decade include F. A. O. Phillips & Associates (1970), UNECON Associates (1970) by Oyefodunrin and others, ENPLAN (1970) by Okonkwo and others, and Mek-Ind Associates (1974) by Dr. Shonubi and others. Others include Etteh Aro & Partners (1970), Comprehensive Engineering Consultants (1971) by Engr. S. O. Fadahunsi, Progress Engineers (1971) by Dr. J. O. Folayan, SSHWED Associates (1972) by Engr. M. O. Adesina, Vasons Concept (1973) by Engr. Yemi Songonuga & others, and Kunle Okunoren & Associates (1973). Many of these firms were to play major roles in ACEN and the engineering consulting industry in Nigeria.

These were, however, mostly young firms embarking on the business of consulting engineering for the first time. Young engineers were recruited into these firms and had exposure to engineering design and supervision. Foreign engineers, mostly from India and Sri Lanka, had to be recruited be able to cope with the volume of work. A typical partner in 1975 had about 12 years experience, and a workforce of considerably less experience.

With the volume of work available, resentment of foreign consultants diminished. There was enough to go round. Indeed, most of the new consulting firms formed partnerships and joint ventures with foreign companies to execute projects. In trying to develop local capacity, the federal government adopted a policy that all foreign consulting firms must have local partners on Nigerian projects.

Some of these firms did very well and grew to medium sizes of between 50 and 150 staff in the period. Most remained small with generally less than ten staff. Some used the opportunity of joint ventures with foreign firms to acquire technical and management competences. Others left most of the work to the foreign firms.

By the time of the first economic recession of the early eighties, most of the firms had not acquired enough management and business competence to adapt and perpetuate the companies. Several of them therefore rose with the boom and fell with the bust. By the late-eighties when there was temporary respite from the recession, their business strategy that relied essentially on the old school mate/ civil service colleague network was no longer sufficient to sustain the hitherto successful practices. Of the firms that thrived in the sixties and seventies, very few are industry leaders today. Only a few consulting engineering firms from this period managed to successfully hand over the ownership and management of the firms to the next generation. Most of the other firms either no longer exist or are a shadow of themselves with several having to contend with managing rapidly depreciating assets.

Benefit of hindsight suggests that the probable reason for this difficulty to adapt is that there was very little business exposure in the background of these initial founders. As a result, much more emphasis was placed by them on the technical aspects of the profession. There was a lot more professionalism than there was business in the practices. The required management and business structures that were necessary to survive difficult times in business were not well understood and therefore could not be put in place. In the notes to the book, The Advance of African Capital by Tom Forest, he reported as follows:

> *The entrepreneurial private sector also rose to the challenges and opportunities of development of the seventies. Many new factories were established to produce a wide variety of products. Some of these include GACOL Industries (1977) and Marston Barrow Foods (1980) in Sango Ota; Isoglass Industries (1979), Bodefoam (1979), Atlantic Carpets (1979), Standard Brewries (1981), and Diamond Foods (1981) in Ibadan; Shokan Industries (1978) at Ijebu Igbo; International Breweries (1978) in Ilesha; Bisrod Furniture (1978) at Ijebu Ode.*
>
> *Alfred Rewane promoted a series of companies at Sapele with the Seaboard Groups of the United States. They included West African Shrimps (1969), the second flour mill in Nigeria, Life Flour Mills (1971), Top Feeds (1977), and Delta Pack. (Interview with Ebison Rewane, Victoria Island Lagos, March 1993.)*

The Federal Government also initiated several industrial projects. In addition to the steel complex, there were three motor assembly plants built for Peugeot, Volkswagen and Mercedes.

Older firms such as Nigerian Breweries, Guinness, West African Portland Cement, Nestle, Nigerian Bottling Company, Lever Brothers, PZ, and several others expanded their facilities. The industrial estates in Lagos, Kano and Port Harcourt grew. A new industrial estate was created at Agbara, led by Chief Adeyemi Lawson, to provide additional facilities for the new companies.

Import and export businesses focussed on electronics and car sales thrived. New companies such as Adebowale Electronics and Elizade Motors emerged. A huge electronics market driven by the informal sector grew at Alaba market, west of Lagos.

The civil service was equally challenged by the scale of development. With so many projects going on, and large-scale resignation of senior personnel to form their own firms, there was a dearth of competence within the system. Promotions were rapid and people had to take responsibilities beyond their competence.

Local contractors could not cope with the scale of construction work and disappeared from the highest category. Their place was taken by international contractors who had a field day. and were present in large numbers. Some of the biggest ones are Julius Berger and Strabag from Germany, Dumez and Bouygues from France, Guffanti and Borini Prono from Italy, and Costain, Tarmac and Taylor Woodrow from the United Kingdom.

Engineering Management & Regulation

While all these were happening, there was no coherent plan for engineering development in the country. Several institutions had direct responsibility for engineering development. These include the federal engineering driven ministries led by the Federal Ministry of Works, engineering regulatory body, COREN, engineering societies led by NSE and including ACEN and others, universities and polytechnics, and research institutions.

At the head was the Federal Ministry of Works and Housing. Most infrastructures works were awarded by this ministry, and most other ministries looked up to it for guidance on engineering procurement. With the volume and scale of projects going on, however, every ministry and parastatal had too much to bite and standardisation, regulation, monitoring and control was grossly inadequate. There was a severe shortage of skilled personnel with enough exposure and experience.

Six ministers headed the Ministry of Works and Housing in the seventies. There were two under the Gowon administration, Mr. Femi Okunnu (1967-1974) and General Olusegun Obasanjo (Jan–June 1975). There were four under the Muritala/Obasanjo regime: Commander Olumide (Jul 1975-76), Major General O. E. Obada (1976-77), Mr. Oberu Aribia (1977-78) and Major General Muhammadu Shuwa (1978- June 79). Mr. Okunnu led the drive to obtain the COREN Decree for the engineering profession. He also promoted the use of local engineers and other construction professionals. Beyond this, however, there was no clear appreciation of the role of engineering in the national economy beyond the provision of infrastructures.

COREN was now the statutory body for the registration of engineers in Nigeria. Its first chairman was Mr Haffner, an electrical engineer with the Federal Ministry of Works. He was appointed by the Minister for Works and Housing, Mr. Femi Okunnu and served from 1972 to 1974. He was succeeded by Prof I O Oladapo, a professor of concrete structures at the University of Lagos from 1974 to 1977, and then Chief S. O. Fadahunsi, a retired public service engineer and then a consulting engineer from 1977 to 1986. The registrars were M. A. Kanyi (1972–73), A. A. Bodede (1974–79) and T. A. J. Oluwole (1979 – 86). The Council maintained a register of engineers, admitting qualified engineers after interviews and authorised them to practice engineering in Nigeria. This covered both citizens of Nigeria and foreign nationals wanting to practice engineering in Nigeria. The council also introduced mandatory supervised training of engineering students as well as graduate engineers as a requirement for registration. Beyond the classification, registration and encouragement of supervised training, not much engineering regulation could be perceived

Next to COREN in engineering regulation was the Nigerian Society of Engineers. At the helm of affairs from 1969 to 71 was Engr Obi Obembe as president. He was succeeded by Dr. S. O. Meshida from 1972 to 1973, C. S. O. Akande from 1974 to 1975, Teju Oyeleye from 1976 to 1977 and I. Igiehon from 1978 to 1979.

Engr Obi Obembe took over as President of NSE from Engr. S. O. Fadahunsi in 1969. This was the first time the society was having an engineer whose background was largely in the private sector as a practising consultant as its president. He urged senior engineers to leave the security of paid employment in government ministries or parastatals, take the risk and run consultancy firms as one would run a business. He advocated this as more challenging and necessary for the professional development and maturity of the Nigerian engineer. In a joint statement signed with his publicity secretary, F. A. O. Oseni, and published in The Nigerian Engineer the Society admonished government's obsession with the recruitment of foreign engineers and counselled people in government to:

> *"...make it obligatory for foreign engineering firms, who control the bulk of the consulting, construction and manufacturing industries in this country to employ Nigerian engineering graduates."*

The Editorial message of the same journal pointed out that:

> *"One of the greatest challenges facing Nigerian engineers is how to ensure that some of the technological innovations that will be in use on this planet by the turn of the 20th century will be products of Nigerian engineers and technologists.*
>
> *One factor that will determine whether this can be achieved is the rate at which Nigerian scientists, technologists and engineers are produced and employed in fields relevant to their training in the country"*

NSE, though immensely popular among engineers, was however still struggling to find its feet. Its headquarters was at a rented apartment on Herbert Macaulay Road in Yaba, Lagos, and it just had the minimum resources to maintain registration of new admissions. Giving engineers the platform to be recognised and heard and to network was its major achievement. It definitely was not in a position to offer strategic solution to the development of a strong construction industry at this time.

ACEN in the Seventies

Perhaps because of the challenges of formation, or the difficulties of resolving issues with the Ministries of Trade and of Justice, or simply because of the efficiency and charisma of the first set of Officers of Council, F. A. O. Phillips remained president of ACEN from 1971 to 1981, with V. O. Oyefodunrin as secretary and T. O. A. Bamgbopa as treasurer. The focus of the newly emerging ACEN was essentially the welfare of its members, and attention was not paid to the overall regulation of the construction industry. The major achievement of this period include the preparation of the scale of fees, establishment of the minimum conditions for membership and its membership of FIDIC,

ACEN Scale of Fees and Conditions of Engagement became the first singular achievements of the association. A draft copy of the document was sent to the Nigerian Society of Engineers on the 13th of February 1973 and was approved by the Council of NSE for use by consulting engineering firms. It formed the basis of all other government consideration on fees for professional services. The federal government subsequently introduced in 1975 a Scale of Fees for Consultancy Services in Engineering, Architecture, Quantity Surveying and Land Surveying for infrastructures and building projects. The fees were based on percentage cost of works, with an alternative for man-hour based assignments. This schedule was revised in November 1992. In order to cope with situations where it is not possible to apply the percentage cost of works for the computation of Consultancy Fees, ACEN produced Guidelines on Man Month Charges for Engineering Consultancy Services. The Guidelines were complementary to the Federal Government Schedule of Scale of Fees. It was first published in July 1987 but has been revised since November 1993.

Under F. A. O. Phillips, ACEN applied and was accepted as a member of the International Federation of Consulting Engineers, FIDIC (Federation Internationale d'Ingineur Conseil). The process of joining FIDIC and the activities of ACEN in this organisation are the subject of chapter 11.

In the area of education and training, the number of universities offering engineering in Nigeria increased from three (Ahmadu Bello University, Zaria, University of Lagos & University of Nigeria, Nsukka) to five with the addition of engineering departments to the University of Ife, and the establishment of the University of Benin. The range of courses offered also increased from the traditional civil, mechanical and electrical engineering to include chemical engineering. The facilities provided in these universities were of international standards, and the lecturers were mostly Nigerians who had won scholarships to study abroad in some of the best universities and returned home to lecture. Intake into engineering faculties was also very competitive, with the more brilliant students being admitted.

With the benefit of good infrastructures, good lecturers, good students and good work opportunities, the universities in Nigeria in the seventies were indeed world standard. Several of the graduates were of such high quality that they easily gained admission to world-class universities such as Oxford, Cambridge, Imperial College and Manchester universities in England, and MIT, Stanford, Harvard and other Ivy League universities in the US. The polytechnics also continued to increase in number and to train students for the engineering industry.

The lecturers were also of such high quality that they were invited as external examiners in these international universities. Professor Awojobi and Professor Adekola, both of the University of Lagos, went on to obtain D Sc. Degrees of the Imperial College, University of London.

The local universities were still unable to cope with the demand for engineering courses, and both the federal and state governments continued to give scholarships to students to study abroad. There was thus a large number of Nigerian students in universities all over the world. The oil companies also gave scholarships, as well as other multi-national companies.

Industrial training also featured prominently in the building of local capacity. Oil & Gas firms sent students to work on facilities abroad, the Niger Steel Development Authority sent graduates to Russia and India for factory experience, and most of the contracts awarded had specific provision for staff training.

A major contributor to capacity building is the opportunity to take part in projects under seniors. The procurement practice then was that foreign firms had to work with local firms on projects as a matter of policy. This allowed rapid acquisition of competence.

Thus, competent Nigerians were being produced as rapidly as practicable. In spite of this, however, there were still not enough

engineers to cope with the volume of work available, and engineers had to be sourced from the international market. Most of them came from Sri Lanka and India. They worked in consulting firms, contracting firms and the civil service mostly and complemented the local efforts.

The senior engineers of the seventies must, however, be commended for giving birth to the practice of consulting engineering in the country, and giving very good technical if not so good managerial and business account of themselves. As individuals, they were as technically competent as anybody else in the world in their time. At the society level, they gave birth to the Nigerian Society of Engineers, NSE, the Council for the Regulation of Engineering in Nigeria, COREN and the Association of Consulting Engineers Nigeria, ACEN and other professional institutions. At the strategic national and business levels, however, they could not leave much of a legacy of successful practices.

As can be seen Table 3 , sixty-five of the hundred engineering consulting firms in ACEN were located in Lagos, which consolidated Lagos as the base of consulting engineering practice in Nigeria, and of ACEN. Some of those with head offices outside Lagos had branch offices in Lagos. The reason for this was simple; Lagos was the federal capital and most of the projects emanated from there.

The war of course disrupted life in the east, and engineers from the east needed time to catch up. By the end of the seventies, considerable progress had been made in this direction.

Table 3 ACEN Members and Their Firms as at November 1980

Acen No	Acen Members	Firm	Location	Year Formed	
1	Phillips	F A O Phillips & Associates	Lagos	1970	1
2	Adejumo	Adejumo, Ogunsola & Partners	Lagos		2
12	Ogunsola	Ditto			
3	Oyefodunrin	Unecon Associates	Lagos	1970	3
14	Soyanwo	Ditto			
4	Obi Obembe	Obi Obembe & Associates	Lagos	1959	4
5	Fadahunsi	Comprehensive Engineeering Consultants	Lagos	1971	5
6	Bamgbopa	Civ-Struct Associates	Lagos	1968	6
22	Oke	Ditto			
23	Olowu	Ditto			
7	Onub1	Mek-Ind Associates	Lagos	1974	7
8	Omisore8	Omisore, Afolabi & Partners	LagOs	1963	8
12	Afolabi	Ditto			
9	Mrs J O Maduka	Leccom Associates	Lagos	1970	9
10	Akinsete	Finco Engineers	Lagos	1969	10
11	Fajemirokun	Chris Fajemirokun Associates	Lagos	1972	11
12	Olaniyan	Olaniyan Omotosho Santos & Associates	Lagos		12
20	Omotoso	Ditto			
21	Santos	Ditto			
15	Tade	Tacas Associates	Lagos	1971	13
16	Fowora	Ademola Fowora Associates	Lagos		14
17	Olumide	Osot Associates	Ibadan	1968	15
18	Segun	Ditto			
24	Tokun	Ditto			
19	Soboyejo	Soboyejo Associates	Lagos		16
25	Agbim1	Agbim & Partners	LAgos	1965	17
26	E O Phillips	Phlifag Engineering	Lagos		18
27	Folayan	Progress Engineers	Lagos	1971	19
28	Adesina	Sshwed Associates	Ibadan	1972	20
29	Osinowo	Ditto			
30	Adedeji	Ditto			
31	Adekoya	Leecon Associates	Lagos	1971	21

32	Ogunbekun	Ditto			
33	Adesunloye	Sol-Fond Limited	Lagos	1970	22
34	Ogundipe	Adeyemi Ogundipe & Partners	Lagos	1972	23
36	Adeyemi	Ditto			
88	Adu	Ditto			
35	Babayeju	Bab Consult	Lagos	1974	24
37	Oyebolu	Molecular Consultants & Associates	Lagos	1975	25
38	Rogers	Ward Ashcroft & PArkman	Kaduna		26
39	Uhimwen	Dou Associates	Benin		27
40	Olawoye	Olawoye Waterman & Partners	Lagos	1976	28
41	Etteh	Etteh Aro & Partners	Ibadan	1970	29
42	Makanjuola	Makanjuola Associates	Lagos	1976	30
43	Eze	Gaebrooks International	Enugu		31
44	Songonuga	Vasons Concept Group	Lagos	1973	32
45	Shoderu	Ditto			
46	Eleso	Maeles Engineering Nig Ltd	Lagos		33
47	Morgan	Morgan Omonitan & Associates	Lagos	1972	34
48	Odubiyi	Sono & Partners	Lagos	1975	35
102	Okwudarue	Ditto			
49	Ladeji	Ditto	Ibadan		36
50	Sogunro	Mecholect Engineering	Lagos	1980	37
51	Gureje-Ashogbe	Syndeng Consultants	Lagos		38
52	Umeano	Feum Engineering Company	Enugu		39
53	Laseinde	Airkonsult	Lagos		40
54	Nwaoshai	Benthas Electrical Consultants	Benin		41
55	Oyemade	Ove Arup & Partners Nigeria	Lagos		42
56	G I Oluonye	Oluonye & Partners	Benin		43
57	P C Oluonye	Ditto			
58	Odaro	Ino Consultants	Benin		44
59	Sonuga	Enplan Group	Lagos	1970	45
91	Williams	Ditto			
60	Solagbade	Solatek Consultants	Lagos		46
61	Akinbobola	Wisd Consulting Engineers	IbadAn		47
62	Adeyemo	Tempas Consultants	Lagos	1970	48
63	Oyewo	Ditto			
64	Adigun	Ditto			
65	Ilumoka	Oladipo Ilumoka & Associates	Lagos	1979	49
66	Carpenter	Stucteng Associates	Lagos	1972	50
67	Anyaegbulam	Ditto			
68	Nwuocha	Ben Mose & Partners	Enugu	1975	51
69	Adigun	Molad & Molad Associates	Lagos	1973	52
70	Omodara	Ditto			
71	Unuigbe	Interplan Engineers	Lagos	1977	53
72	Doherty	Kunle Okunoren & Associates	Lagos	1975	54
97	Okunoren	Ditto			
73	Taiwo	Edison Group & Partners	Lagos	1974	55
74	Okoro	Okoro & AsSociates	Enugu	1972	56
75	Eneda	Andisen Consultancy	P Harcourt	1979	57
76	A A Oke	A A Oke & Partners	Lagos		58
77	Imoisi	Mek-Consult	Benin		59
105	Bafuwa	Ditto	Lagos		
78	Uzoka	Ditto	Lagos		60
79	Akindeinde	Akindeinde Allot & Lomax Nig Ltd	Lagos	1975	61
80	Ajidahun	Adeola Ajidahun & Partners	Calabar		62
81	Osibodu	Ladiom & Associates	Lagos	1971	63
82	Oguntoye	Ditto	Kaduna		
83	Adenubi	Intertech Associates	Lagos	1976	64
84	Bridle	Hawksley Pick Everard Nig	Ibadan		65
85	Cole	Ditto	Lagos		
86	Nwankwor	Nwankwor & Partners	Enugu	1975	66
87	S A Adigun	Civgeo Associates	Ibadan		67
89	Onabanjo	Bomeg Associates	Lagos		68
111	Agbashe	Ditto			
90	Odunsi	Hay Barry Odunsi & Associates	Lagos	1973	69
107	Frost	Ditto			
92	Soribe	Mrt Consulting Engineers Nig Ltd	Kaduna		70
93	Akintobi	Akintobi Oyenekan & Associates	Lagos		71
94	Oyenekan	Ditto			
95	Ademosu	Engroa Group Nigeria	Lagos	1975	72
96	Olaiya	Techjob Associates	Lagos	1974	73
98	Tomori	Nidan Consultants	Lagos		74

99	Ashaye	Landscope Consultants	Ibadan	1975	75
100	OkekE	Yaroson & Partners	Lagos		76
101	Oyebode	John Solomon & Partners	Ilorin	1978	77
103	Okwuonu	C Okwuonu & Partners	Enugu	1976	78
104	Ogundiya	Hancock Ogundiya & Partners	Lagos	1980	79
106	Omigbodun	Prouf Associates	Lagos		80
108	Aluko	Scott Wilson Kirk Patrick	Lagos		81
109	Essien	Sien Enterprises	P Harcourt		82
110	Gbadamosi	Del-Kan	Ibadan		83
112	Okunrinboye	Tunde Okunrinboye Partnership	Ibadan		84
113	Akintunde 113	Profen Consultants	Ibadan		85

CHAPTER 6

THE STRESSFUL EIGHTIES

Images a - e, g –h: Officers of ACEN in the eighties
a. Adenrele Adejumo, President 1985 - 1988
b. JO Maduka, Treasurer, 1982/83
c. JO Sonuga, President 1989 -1991
d. Lanre Oyenekan, Hon Secretary 1987 - 1990
e. Obi Obembe, President, 1982 - 1984
f. Segun Doherty, Hon Secretary 1985/86
g. Ralph Eke, Hon Secretary 1990

Image f: Cross-section of members at a function in the eighties.

Image above: Rickety Vehicle – depicting the stressed quality of life in the eighties. by Dr. James Shepherd

THE STRESSFUL EIGHTIES

If the 70s was essentially the decade of formation of ACEN, how did the association fare in its first decade of existence? What were its main objectives, its challenges and its achievements? How did it go about achieving its objectives and in historical perspective, how much did it achieve in this first decade?

If the 70s was a period of economic boom, growth and relative peace for the nation and great opportunities for the engineer, what were the social, political and economic concerns of the 80s, and how did this impact on the engineer?

Political and Economic Environment

Nigeria was governed by three different administrations in the eighties. The first was the civilian administration led by Alhaji Shehu Shagari from 1979 to 1983. The second was the military administration of General Muhammadu Buhari from December 1983 to August 1985, while the third resulted from a palace coup that brought another military administrator, General Ibrahim Babangida who ruled from August 1985 to 1993.

The 1970s had ended with a return to civilian administration after thirteen years of military rule (1966-1979). General Olusegun Obasanjo handed over power to a new civilian government under President Shehu Shagari on October 1, 1979. Nigeria's Second Republic was born with great expectations. Oil prices were still high and revenues were on the increase. It appeared that the pace of development of the seventies was still possible. Unfortunately, the euphoria was short-lived, and the second republic did not survive its infancy.

The election was bitterly contested, with accusation of rigging and counter rigging. But the bane of this election was not the rigging, but the interpretation of the constitutional provision which required the winning candidate to obtain 25% of the votes cast in at least each of two-thirds of the States of the Federation. Nigeria at the time had a 19-state structure, and two-thirds of 19 is not a discrete number but a fraction. The presidential candidate of the winning party, NPN, had won at least 25% of the votes cast in 12 states, but the opposition claimed that 12 was less than two-thirds of 19, which is 12.6666, a non-discrete number. The Supreme Court eventually ruled in favour of Shehu Shagari and he was sworn in on the 1st of October for a 4-year term.

Five major parties contested for power in these elections, with all of them having some linkages with the parties of the first republic. The National Party of Nigeria, NPN, was reminiscent of the NPC and had strong support in the northern states but this time also in the non-Igbo states of south-east Nigeria. The Unity Party of Nigeria, UPN, was the successor to the Action Group with Chief Obafemi Awolowo as its head, and support mainly in the Yoruba states. The Nigerian People's Party, NPP, was the successor to the NCNC and predominantly Igbo with Chief Nnamdi Azikiwe as its leader. The Great Nigeria People's Party, GNPP emerged as the effort to form an alliance of the Igbos and some northern interest groups failed and was led by Waziri Ibrahim of Borno State. The fifth party, the People's Redemption Party, PRP, was the successor to the Northern Elements Progressive Party, NEPU, and was led by Alhaji Aminu Kano.

The NPN won the presidency, and had more seats than any other parties in the Senate and House of Representatives. These, however, did not constitute a majority and a coalition of NPN and NPP, reminiscent of the first republic, was formed to run the central government. Again, as in the first republic, the interests of the two parties were often in conflict, which forced the NPN to operate alone in most situations. The UPN came in with the second largest number of seats and effectively formed the official opposition. Chief Awolowo continued as the spokesman for the left of centre. History was repeating itself. The Great Nigerian People's Party won two states while the People's Redemption Party, won one state and the governorship of another.

The Shagari administration was soon confronted with financial challenges. With the oil boom of the seventies, not only had ambitious projects been continued, the cost of governance had increased considerably with government ministers and civil servants living ostentatiously, and corruption had set in on a massive scale. So when the price of oil dropped sharply in 1981, half way through its tenure, Nigeria went into financial crisis and recession set in, putting severe strains on the administration and the citizens. For political reasons, government spending continued unabated, and the government started borrowing to meet its obligations. Nigeria's foreign debt increased from =N=3.3 billion in 1978 to =N=14.7 billion in 1982. By 1983 the nineteen state governments had run up a combined debt of =N=13.3 billion. As elections approached in August 1983, economic decline that reflected low oil prices, widespread corruption, and continued government

spending at record levels was proof to many that the government and country were in bad shape. The lack of confidence was evident in the massive capital flight estimated at US$14 billion between 1979 and 1983. In spite of this, the NPN won the 1983 election overwhelmingly. NPN increased the number of states under its control from seven to twelve, won 61 of 95 Senate seats and 307 of 450 House of Representatives seats. Shagari was re-elected president. NPN control of government in its next term would be total. These results were bitterly contested.

On December 31, 1983, the military overthrew the civilian government. Major General Muhammadu Buhari emerged as the leader of the Supreme Military Council (SMC), the country's new ruling body with Brigadier Tunde Idiagbon as his second in command. The military regime conducted tribunals purportedly to curb corruption and many people were sentenced to long-term imprisonment, some up to 99 years. It launched a 'War Against Indiscipline' and preached ethics, emphasised patriotism, decried corruption and promoted environmental sanitation. The regime attempted to stifle criticism and many journalists and critics were arrested and jailed. Buhari's biggest problem, however, was Nigeria's foreign debt. Negotiations with the International Monetary Fund (IMF) dragged on, and in the end efforts to reschedule the debt failed. Although Buhari was committed to austerity, the IMF insisted on even more drastic measures to cut spending, devalue the currency, and otherwise restructure the economy than most Nigerians were willing to accept. Buhari had to accede to the strong and vocal opposition to the IMF terms. Nigerian nationalism won out over economic necessity, at least in the short run.

The Buhari government was peacefully overthrown by the SMC's third-ranking member General Ibrahim Babangida in August 1985. Babangida cited the misuse of power, violations of human rights by key officers of the SMC, and the government's failure to deal with the country's deepening economic crisis as justifications for the takeover. He dropped his military title of 'General' and took on the political title of 'President'. During his first days in office President Babangida moved to restore freedom of the press and to release political detainees being held without charge. As part of a 15-month economic emergency plan he announced pay cuts for the military, police, civil servants and the private sector. President Babangida demonstrated his intent to encourage public participation in decision making by opening a national debate on proposed economic reform and recovery measures. The public response convinced Babangida of the intense opposition to an economic recovery package dependent on an International Monetary Fund (IMF) loan.

Babangida addressed the worsening recession through the Structural Adjustment Program, SAP of 1986. By 1986, 44 percent of export earning was being used to service foreign debt. Austerity was not enough; rescheduling the foreign debt was essential, but public opinion was against an IMF loan. The government already was committed to many of the conditions for the IMF loan, including even more austere measures. However, it resisted pressures to reduce the petroleum subsidy, to allow trade liberalization, and to devalue the naira. Although negotiations with the IMF were suspended, the federal budget of 1986 still imposed many of the IMF conditions. On October 1, 1986, the government declared a National Economic Emergency, which lasted for fifteen months. Under the emergency, the government de-emphasized large-scale agricultural projects and introduced salary and wage reductions for armed forces and for public and private-sector employees. Import restrictions were intensified, including a 30-percent surcharge on imports. Officially, the government now encouraged foreign investment and promoted privatization. Finally, the petroleum subsidy was cut back. Despite these drastic moves, efforts to reschedule the foreign debt without an IMF loan failed, and a drop in world oil prices further compounded Nigeria's situation.

Eventually the World Bank stepped in to breach the gap and provided US$4.2 billion over three years to support the structural adjustment program. The eligible debt finally was rescheduled in early 1988. There was heavy devaluation of the naira in 1988, followed by even more drastic reductions in 1989 and early 1990. As a result of the recession, there was a drop in real income, especially for urban dwellers, while unemployment rose steadily to almost 12 percent in 1986. The situation in the second half of the 1980s was even worse, with per capita income falling below US$300 in 1988.

Engineering Development Projects

With the prevailing political and economic conditions in the eighties, engineering development projects suffered major setbacks. But this was not at the beginning of the decade. The Shagari administration continued with the development programmes of the seventies and added a few of its own. By far the biggest project at the time was the development of the Federal Capital City of Abuja.

Under Obasanjo, International Planning Associates (IPA), a joint venture of WRT, Planning Research Corporation, and Archisystems International, was contracted to plan a new national capital city for Nigeria that would be home for more than 3 million people. The new city, called Abuja, was intended to serve both as the new location for the Nigerian federal government as well as an important symbol of national unity. WRT created a distinctive identity for the city through site selection and detailed design of the central area, which comprises the national government centre, national cultural institutions, and the central business district. Outside the central area, residential mini-cities with populations of 150,000 to 250,000 are organized around local business and employment centres, and are connected to other parts of the city by exclusive transit-ways. The Shagari administration continued with this programme and many others. Even when the price of oil dropped in 1981, the projects continued. Without strong institutional framework for implementing these projects, however, they eventually ran into severe difficulties.

Three main factors influenced how engineering projects were run in the eighties. The first was the need for political control of ministries and parastatals of government. Ministers and chief executives of parastatals were chosen, not by professional competence or articulated programmes of action, but by patronage and loyalty to the president and the party. The effect of this was that most engineering driven ministries did not have engineering oriented leadership or programmes that could deliver the projects under their ministries. Increasingly, the political leadership took over the running of engineering projects, and advice from professionals in the ministry ignored. The politically astute professionals read the picture and learnt to give "acceptable advice" to retain their position or rise to higher posts. Rather than compensate for the gaps in the competence of the ministers, the more competent professionals were marginalised in favour of the more politically astute.

The second challenge was that of corruption. The capital expenditure of major engineering projects is often large and will always provide attraction for the greedy. The political leadership of these ministries had two main focuses, to make money for the party so as to be able to run the next election, and to make money for themselves so as to continue to be relevant in the scheme of things. Their home constituencies also required of them to be affluent to support programmes and individuals in the village. The primary purpose of the project of providing the necessary infrastructure is often remote. The system therefore sought out those who could discreetly pay the appropriate price for patronage. There was never a shortage of foreign businesses willing to cooperate, provided the returns off-shore, and not being local, be very discreet. Increasingly, the price increased from just a percentage of the contractor's price to direct addition to the base price, inflation of contracts became rampant.

The third challenge was the need to show accomplishment to the public by the government. This necessitated that the projects be visible and be completed within the tenure of the incumbent. This objective ensured that experienced foreign companies with long track records were to be preferred to young local companies with properly trained staff and enthusiasm but little experience. Foreign companies, supported by their home governments, embassies and donor agencies, presented attractive proposals and were very successful in winning projects.

The resulting effect of these factors included the lack of any strategy for the development of local competence in engineering and construction, provision of unsustainable infrastructures, high cost of projects mostly in foreign exchange, unemployment and under-employment of engineers, among others. According to Ade Ajayi,

> *The Nigerian Society of Engineers documented in 1968 that in the award of contracts for highways, expatriate firms took 95.1% leaving 4.9% to Nigerians. By 1985, it again documented that the situation had not improved. Between 1974 and 1983, of the =N=6,859 million spent on projects 94.2% went to expatriate firms and 5.8% to local firms. As the Association of Consulting Engineers Nigeria put it, all the major "pride of the nation" projects in the NNPC, LNG, NEPA, NITEL and other Government parastatals appeared to have been reserved for expatriate firms.*

The Buhari administration was too short lived and pre-occupied with the financial crisis and indiscipline to have any impact on the engineering and construction industry. What cannot, however, be forgotten are the tribunals set up to probe projects, and the severity of the punishment metted out. Projects are of course the main areas in which engineers operate, and most engineers were apprehensive of being invited to the probe and being detained. Fortunately, none of the members of ACEN was caught in this web.

The Babangida administration lasted a much longer duration and could have influenced engineering significantly. His concentration, however, was politics, power and the economy, and the significant role engineering and construction could play was not appreciated. Although with less resources, the challenges of the Shagari administration: political leadership of ministries, corruption and preference for foreign consultants and contractors remained.

The reduced volume of work and the increased corruption in the polity brought considerable distress to the consulting industry in the country. Many firms were unable to pay salaries regularly and the debt kept increasing. Projects were not being funded and idle staffs were being kept, including expatriates that had been recruited to cope with the boom. Eventually staff had to be laid off and some firms closed down totally. Young engineering graduates were no longer able to get employment. This was double jeopardy for them; they had stayed two extra years in school, only not to find employment on graduation.

Nigeria that had hitherto imported engineers now had a glut of them. There was the case of a young engineer who had a steady job but had resigned and gone abroad for post-graduate studies. On return there was no longer any job for him and he had to accept employment as a draftsman. The additional competence acquired could only secure him a lower position. Qualified Nigerians who would normally come home after graduation now stayed back because of job uncertainty. Those at home started moving abroad, the beginning of brain drain. The accumulated experiences of the seventies were dispersed rather than consolidated. Firms got smaller and one-man firms mushroomed to keep body and soul together. Many went into construction hoping that the larger cash flow in construction would offer better chances of survival.

Engineering Administration

The Ministry of Works and Housing had nine ministers between October 1979 and 1990. Under the Shagari administration were Victor Mazi (1979–81), Wahab Dosunmu (1980-82), Sunday Esang (1981-83) and I. Igbani (1983-84). Under Buhari were Yerima Abdullahi (1984-85) and E. N. Nsan (1984). Under Babangida were H. Abdullahi (1985-86), Alhaji Abubakar Umar (1986-87) and Major General Kontagora (1987-93) and Engr. B. A. Gemade (Jan-Nov 1993). Only one of these, Engr. Barnabas Gemade, was a COREN-registered engineer and he served only for eleven months. Mr Wahab Dosunmu trained as a town planner and gave support to ACEN. For the first time, a federal minister endorsed the association and prescribed its membership as one of the considerations to be evaluated in the award of consulting assignment by his ministry. Major General Kontagora although a military officer also trained as an engineer and his six-year tenure allowed him to adequately understand the ministry. The Scale of Fees was revised and approved under his tenure.

The president of COREN up till 1986 was Chief Fadahunsi, and he was succeeded by Engr Faluyi from 1988 to 1991. Engr Segun Adedeji (1988 – 90) also succeeded T. A. J. Oluwole as Registrar. COREN continued with its routine work of registering engineers to practice.

NSE, with a two-year term for each president, had six presidents: Engr. O. Olugbekan(1980 – 81), Engr. Rev. P.B. Oyebolu (1982 – 83), Engr. M. N. A. Manafa (1984), Engr. A. O. Faluyi (1985 – 86), Engr. Ife Akintunde (1987 – 88), and Engr. I. K. Inuwa (1989 – 90). In 1986 the Engineering Centre in Victoria Island was opened as a permanent headquarter of the society. It was also intended to be a National Engineering Centre with a library, a museum, a centre of research, seminars, conferences and debates. The construction of this centre began in 1960.

ACEN in the Eighties

Four presidents served ACEN in this decade, F. A. O. Phillips from 1971 to 1981, Obi Obembe from 1982 to 1984, Adenrele Adejumo from 1985 to 1988, and Justus Sonuga from 1989 to 1991.

The foundation president, Engr. F. A. O. Phillips continued in office till 1981, thus serving for ten years. Dr. A. A. Adejumo took over from Engr. Oyefodunrin as secretary while Engr Bamgbopa continued as treasurer till 1982. Engr. Obembe, the only engineer to date who was president of both NSE (1970-71) and ACEN took over the mantle of leadership from Engr. Phillips and served from 1982 to 1984. Dr. J. I. Folayan was the secretary in 1982/83, to be succeeded by Olusegun Doherty. Mrs. J. O. Maduka was the treasurer in 1982/83 and was succeeded by Olasupo Ademosu (1984/85). Council members for the 1984/85 year included T. M. Aluko, Dr. S. O. Adenubi, H. S. Samaila, E O. Ogundiya, M. O. Akintobi, A. Ajidahun, E. D. Osibodu, R. A. Adu, Y. L. Sagaya, B. O. Ngwuocha, C. Okwuonu, D. O. Uhimen, I. A. A. Okunoren, M. O. Adesina, A. A. Songonuga and T. O. A. Bamgbopa.

Engr. Dr. Adenrele Adejumo assumed the leadership of the Association in 1985 and served till 1988. There were two honorary secretaries, Segun Doherty (1985/86) and Lanre Oyenekan (1987-90). There were also two honorary treasurers, Engr. M. O. Akintobi (1986/87) and Dr. Edet Amana (1988-1990). The last president for the decade was Dr. J. O. Sonuga (1989-91). Two honorary secretaries served with him, Lanre Oyenekan and Ralph Eke (1991). There were also two honorary treasurers, Edet Amana and E. A. Babaniji (1990-96). There was still no tenure for council members at this time, and most of the council members of the preceding administration remained. General Ibrahim Babangida assumed the leadership of the country and the structural adjustment program was introduced. Not much of engineering voice was heard in the national debate.

The Association soon established a pattern for its activities which included quarterly luncheons to which dignitaries in the society were invited and topical issues discussed, an annual conference and general meeting of the Association, and regular meetings of council. Not having a secretariat of its own, the meetings were held in the office of the incumbent president. To assist the honorary secretary, Dayo Oyenekan, a brother of the then honorary secretary, Lanre Oyenekan, was appointed as the third administrative secretary of the association in 1987 and retired with him in 1990. The Association also published annual directories of its members to assist in promoting their businesses, as well as a journal, the Consulting Engineer, which carried both technical and managerial articles.

Members of ACEN also continued to attend the annual FIDIC conferences all over the world and play active roles. FIDIC was formed in 1913 to regulate the consulting industry and protect the interest of its members who are the member associations from various countries. It was run by an Executive Committee elected by members. One of the regular attendees at the conference was Joseph Folayan. He showed interest in joining the executive committee and filed his application. He, however, had to suffer three defeats before he was elected on the fourth try in 1988.

With the economic crunch in the country, interest in the Association started to wane in the mid-eighties, and turn-out at council meetings and association's events became poor. Many consultants complained that the Association was not able to offer any assistance in the face of the downturn in the economy. But this was a very young Association and it did not have the infrastructure to address issues that were confronting members.

The membership of the association was also not growing much. ACEN had been formed by the elites of the engineering profession. All of them were in their forties and fifties and had given good accounts of themselves in their previous preoccupations. New and younger consultants therefore perceived them as elitist. The values to be derived from joining ACEN were not clear.

Nor did membership of the Association seem to present any disadvantage to non-members in getting projects. With the take over of government by the military, what seemed to matter was your network with senior government officials, rather than your experience or reputation. Both qualified and unqualified professionals were indiscriminately patronised by government agencies.

It is not clear that the Association was necessarily interested in increased membership at this time, and no record of such drives for the 80s have been found. New members were admitted largely by invitation from existing members. The objectives of the Association in 1979 were stated in its Articles and Memorandum of Association as follows:

> *"The Association of Consulting Engineers was formed with the object of promoting the advancement of the profession of consulting engineering and of providing facilities for Government, Public Bodies, Associations representing industry and trade, and others to confer with Consulting Engineers as a body and ascertain their collective views. The Association is a medium through which the public can be informed as to the standing, experience and qualifications of its Members. If any person requires professional advice and assistance and is in doubt as to whom to approach, the Association is always willing to nominate one or more of its Members specially qualified for the purpose."*

This objective did not particularly address growth in membership.

The final aspect in engineering development in the country, the education of engineers as indeed of all other professions, also suffered greatly in this decade. There were two major problems: under-funding of tertiary institutions, and incessant closure of these institutions for months

at a time. The situation was so bad that students lost two academic years, extending their stay in the university to over seven and six years respectively for engineering and other courses. A new phenomenon, students' cultism, also arose making the university an unsafe place to live and study.

The Babangida years, in particular, were characterised by labour unrest and disruption in the educational system. In May 1986, students at the Ahmadu Bello University and the Kaduna Polytechnic staged demonstrations that led to military occupation of those campuses and to the deaths of a number of students. The student movement had considerable support at other universities. On June 4, 1986, the Nigerian Labour Congress in alliance with students and university teachers organized a national day of sympathy, which led to the arrest of many union leaders. University closure arose from both students and staff protesting against either political developments, students' and staff welfare, or poor funding of the universities. Table 4 from the article, Student Unrest in Nigerian Universities: Looking Back and Forward by O. Aluede, B Jimoh, B. O. Agwinede and E. O. Omoregie shows a catalogue of closure due to students' unrest in the eighties.

The funding of education was particularly acute. The universities were getting old, and equipment were becoming obsolete with changing technology. Student population was increasing. Yet the universities were not funded. In a 2002 paper by Professor Ayodeji Olukoju of the University of Lagos, he wrote:

> *By the early 1980s, Nigeria had entered a period of economic crisis, culminating in the adoption of the Structural Adjustment Programme (SAP) by 1986. An immediate consequence of this was the steady and calamitous devaluation of the currency (the Naira) which began to yield ground to the US dollar. The exchange rate plunged from a height of US$ 1.0 to =N=1.5 in 1979 to US$ 1.0 to =N=35 by the late 1980s. Today, the ratio is one dollar to =N=146. Another consequence of the economic depression was the general neglect of tertiary education and the specific marginalisation of courses or subjects which were not considered directly relevant to the nation's quest for technological development.*
>
> *The Humanities in general were the early casualties of this policy at a time that, ironically, the literary giant, Wole Soyinka, won the nation's first ever Nobel Prize in 1986! In any case, the universities were given the carrot-and stick treatment by successive military regimes, most notably the Babangida dictatorship (1985-93). This entailed, on the one hand, a deliberate recruitment of some of the most articulate scholars and critics into top government positions (as ministers, advisers and ambassadors), and, on the other hand, a series of repressive policies in dealing with the legitimate demands of academic staff and student unions. Prolonged and intermittent strikes, violent demonstrations and inevitable closures then became the lot of the tertiary institutions.*

Table 4 Record of University Closures in the Eighties

Year	Institutions	Stated Causes of Unrest	Consequences
1981	Ahmadu Bello University, Zaria	Student died and Vice-Chancellor over alleged rice deal	Religion and against Vice-Chancellor dismissed
1984	Many Nigerian tertiary institutions	Proposed introduction of tuition fees and the scrapping of catering services	Many Universities were closed down for months
1986	Many Universities in Nigeria	High handedness of the Vice-Chancellor of Ahmadu Bello University, Zaria while several students were	Most Universities in Nigeria were closed down for months expelled
1988	Many Universities in Nigeria	Removal of subsidy from petroleum and allied products.	Many schools were closed for a period of six months
1989	Several schools in many parts of Nigeria	Introduction of Structural Adjustment Program (SAP) by the Military Government	Improved conditions of service for workers Closure of several institution for about six months Many students lost their lives during the protest as a result of open shooting by Police/Army
1992	Many Universities in Nigeria	Deregulations of Nigerian currency and mounting hardship improved, while several schools were closed for months	Several students died, workers' conditions of service were

These crises had a direct impact on academic research and publishing. First, many outstanding scholars simply fled the country's tottering ivory towers for more stable climes. Second, those who did not leave by choice or lack of it were distracted into pursuits aimed at ensuring their material survival. Some left the academia for business or the private sector which offered greater financial remuneration and material comfort. Still others simply vegetated as library facilities proved increasingly obsolete and grossly under-funded. Libraries could no longer subscribe to current journals and, consequently scholars could no longer keep pace with developments in their fields. Many dropped out of the race and stopped writing for international journals which routinely rejected manuscripts that attempted to disseminate outdated concepts and intellectual arguments.

Yet another dimension to the neglect of the Humanities was the drying up of funds for international conferences and personal or individual research. The collapse of the Naira and the relative drop in the budgetary allocation to (tertiary) education meant that university administrators had to focus mainly on the regular payment of staff salaries and the maintenance of rapidly collapsing infrastructure. It was no longer possible to fund lecturers' participation in international conferences and many scholars missed important conferences when the organizers could not provide the flight tickets and waive registration fees. Participation in local conferences did not suffer a complete eclipse because of the lower costs and for the fact that the committed academics could manage to fund themselves. Long standing institutional journals also bore the brunt of this neglect. This was, ironically, at a time that the age-old demand for academic publications for promotion remained unabating. As would be shown presently, Nigerian scholars were compelled to adapt to the changing circumstances, making the best of the unsavoury situation.

Although Prof Olukoju was writing about the humanities, science and technology did not fare any better. The consequent damage to education was severe. Nigerian universities which could hitherto hold their own against other good universities in the world were now poorly rated as students were rushed through the syllabus in time for examinations.

None of the organs responsible for engineering development had any strategic response to the challenges of the eighties. Not the Federal Ministry of Works, not COREN, NSE, ACEN or any other societies, not the universities or research centres fundamentally addressed the issues and challenges of this period.


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CHAPTER 7

THE TENSE NINETIES

Images a - i: Officers of ACEN in the nineties
a. Kunle Ogunbayo, Hon Secretary 1995 - 1996
b. Bayo Adeola, Hon Secretary 1997 - 1999
c. Debo Adeola, Hon Secretary 1992 - 1995
d. Victor Oyefodunrin, President 1992 - 1994
e. EG Sogunro, Hon Treasurer
f. EA Babaniji, Hon Treasurer
g. IAA Okunoren, President
h. Kola Idowu, Administrative Secretary 1993 to Present

Image above: Students protesting. by Robert Prather

CHAPTER 7

THE TENSE NINETIES

The political climate of the nineties was tense and stressful. It started with the political transition program of the Babangida administration, went through the June 12, 1993 election saga which culminated in the seizure of power by Sanni Abacha, and ended with the commencement of the civilian administration of the third republic under Olusegun Obasanjo in 1999.

Economically, it was still a difficult decade. After the initial gains of the structural adjustment programme in the late 1980s, the early 1990s was characterised by increased public spending by government and lower productivity. Foreign debt increased and a considerable percentage of GDP was being spent in financing interest on this debt. Regulation of the economy returned with the Naira fixed at =N=22 to the dollar.

President Babangida had promised a return to civilian rule by 1990, only to extend it to 1993. In October 1989 the government established two parties, the National Republican Convention (NRC) and the Social Democratic Party (SDP). It also adopted a new voting procedure called Option A4 whereby voters would line up in public behind their preferred parties so that the votes recorded could be verified. The first elections were those of the state and national assemblies, followed by the gubernatorial elections and finally the presidential election. The presidential election was held on June 12, 1993 with the inauguration of the new president scheduled to take place August 27, 1993, the eighth anniversary of President's Babangida coming to power.

The June 12, 1993 presidential election was considered by most observers to be the fairest election Nigeria has ever had. Early returns showed that the presidential candidate of the SDP, Chief M.K.O. Abiola, was leading decisively and the country was eagerly waiting for the announcement of the result. Rather than the announcement from the National Electoral Commission, NEC, it was the president, Babangida, who announced the annulment of the election on the 23rd of June, throwing the country into chaos. After a brief struggle to continue in power failed, he handed power to an interim government on August 27, and chose Ernest Shonekan, a non-partisan private sector chief executive to lead the government until new elections scheduled for February 1994. Not having a constituency, authority or political experience, Shonekan was unable to govern effectively.

Sani Abacha, the Defence Minister, overthrew Shonekan and took over the government on November 17, 1993. Reception of Abacha was initially mixed. Some were happy to see the interim government go and were hopeful that Abiola's election would be reinstated. But when Abacha dissolved all democratic institutions and replaced elected governors with military officers, disenchantment immediately set in. Opposition leaders formed the National Democratic Coalition (NADECO), which campaigned vigorously to reconvene the senate and other disbanded democratic institutions. On June 11, 1994, M. K. O. Abiola declared himself president and was arrested on June 23.

Abacha ruled the country in a repressive manner from November 1993 to June 1998. Several coups were alleged and very high ranking persons, including former head of state General Olusegun Obasanjo, his deputy Shehu Musa Yar'Adua, and Abacha's own deputy General Oladipo Diya were arrested. Some were sentenced to death and others to long-term imprisonment. Abacha died suddenly on the 8th of June 1998 of heart failure and was succeeded by General Abdulsalami Abubakar. Abiola was still being kept captive and still wanted to claim his mandate as the duly elected president when he also suddenly died of heart failure on the 7th of July 1998.

In August 1998 Abubakar appointed the Independent National Electoral Commission (INEC) to conduct elections for local government councils, state legislatures and governors, the national assembly, and president. NEC successfully held the elections. For local government elections nine parties were granted provisional registration, with only three fulfilling the requirements to contest the following elections. These were the People's Democratic Party (PDP), the All People's Party (APP), and the Alliance for Democracy (AD). Former military head of state Olusegun Obasanjo, freed from prison by Abubakar, ran as a civilian candidate and won the presidential election under the PDP.

The economy in the Abacha period was relatively stable, with the Naira exchange rate which depreciated markedly from =N=22 to =N=80 to the dollar maintained stable. The social and political environments were, however, very tense. Abacha ruled with iron hands, and the political class challenged his autocracy.

Engineering in the Decade

With limited resources and an autocratic government, there was little work for the engineers, and there was a scramble for the little there was, using influence and bribery as the main tools of competition.

The major impact on engineering and other sectors of the economy in this decade was through the Petroleum Trust Fund. In October 1994, General Sani Abacha increased the pump price of petrol from =N=3.25 to =N=11 per litre. In order to assuage the public outcry and address the general opinion that revenues from such increases may be embezzled without any improvement in the quality of life, he promised to set up a Petroleum Trust Fund, PTF. The fund was to ensure that the gains from the increase would be spent on social and infrastructural projects. He appointed a former Head of State, Major-General Muhammadu Buhari to head the board of the Fund which was inaugurated on March 21, 1995.

The Fund began with an initial capital of about =N=60bn in 1996. Its mandate was all encompassing and included rehabilitation of roads and waterways, educational and health institutions, providing textbooks and stationary, procuring essential drugs and vaccines, providing water supply systems, reviving crumbling agricultural sectors, connecting outlying areas to the national electricity grid, extending railways and telecommunications and ensuring consistent food supply. As at December 31, 1997, funds available to PTF stood at =N=115.1 billion.

The PTF threw lifelines to several dying sectors of the economy. Pharmaceutical companies were failing and foreign multinationals divesting. Through the drugs procurement programme, PTF gave several of them a new lease of life. Banks and insurance companies also benefited. Contractors were required to provide bank guarantees for advance payments, and their payments were made directly to such banks, which significantly improved liquidity. Performance bonds from insurance companies were also required, thus creating business for the insurance companies.

The programme was, however, not without its critics. The huge budget and all-embracing mandate led some to consider it as "the alternative government," accusing it of duplicating the responsibilities of other existing government agencies. There was, for instance, an initial conflict about who should be tarring which road between the PTF and the Federal Ministry of Works and Housing. There was also concern in some quarters as to the allocation made to the military and the method of implementation and accountability. The PTF allocated 20% of its funds to the military, and another 1% to the Federal Capital Territory. This amount was much more than was allocated to education, health and other critical sectors of the economy and was thus considered hugely excessive.

Implementation of PTF projects depended largely on a private sector management firm, Afri-Projects Consortium, which was to become an active member of the Association of Consulting Engineers Nigeria. Nurudeen Rafindadi and Suleiman Adamu, two senior members of APC, gave some background information on the consortium:

Afri-Projects Consortium was the initiative of Salihijo Ahmad. Salihijo was born in 1957 and hailed from Adamawa State. He graduated in Quantity Surveying in 1981 from Ahmadu Bello University, Zaria and worked for three years before starting a quantity surveying firm, Associated Cost Consultants in Kaduna in 1984. For him, however, taking quantities and pricing bills was not particularly exciting and he sought avenues continuously to give meaning to his restless energy, including offering project management services even when it was little known. In 1990, he conceived of a multi-disciplinary professional practice and invited four of his friends, Abdurrahman Dahiru, Nurudeen Rafindadi, Amina Ibrahim and Murtala Aliyu to join him to create APC.

Abdurrahman Dahiru was born in 1952 and also hailed from Adamawa state. He obtained his first degree in Mechanical Engineering from the University of Manchester in 1975. On return to Nigeria, he worked as a planning engineer with Shell Petroleum Ltd, and later on as a consulting engineer in water resources development. Nurudeen Rafindadi was born in 1960 and had his university education at Ahmadu Bello University, Zaria, where he obtained his bachelor's degree in civil engineering in 1981 and his master's degree in water resources development in 1986. His first employment was with government where he rose to the position of Assistant Director (Drainage). Amina J. Ibrahim was born in 1961 of a Nigerian father from Gombe and a British mother from Wales, United Kingdom. She was educated in Nigeria from the age of 2 in Birnin Kebbi, Kaduna and Maiduguri before finishing in the Isle of Man with a degree in Administration. She came home in 1980

and worked with an architectural firm, Archcon (Nigeria) and an engineering firm, Norman and Durban in Kaduna before joining four of her male colleagues to form Afri-Project Consortium. Murtala Aliyu was born in 1961 and hails from Gombe. He graduated in Quantity Surveying from Ahmadu Bello University, Zaria, in 1981 and worked with the Physical Development Department of the Federal University of Technology, Minna. He co-founded Associated Cost Consultants with Salihijo Ahmed and became a founding partner of Afri-Projects Consortium in 1990.

The idea behind the creation of Afri-Projects Consortium was to venture into multi-sectoral and multi-disciplinary consultancy opportunities that existed in Nigeria, but which were virtually being monopolized by foreign consulting firms. Within a short time, APC had secured a number of commissions from government agencies and especially the African Development Bank. In March 1995, APC made a presentation to the Board of Trustees of the newly established Petroleum (Special) Trust Fund, an intervention agency set up by the Abacha Regime to utilize the gains from the increase in the price of petroleum products for infrastructural development and other social services in the following sectors:

- *Roads, Road Transportation and Waterways*
- *Water Supply*
- *Food Supply*
- *Health*
- *Education*
- *Security*
- *Other Projects (which included programmes in rural telecom, rural electricity, etc)*

APC was subsequently appointed by PTF as its management consultant and tasked to undertake the following:

- *Technical assistance in developing the corporate structure of the Fund, the sectoral funds allocation and intervention policies of the Fund;*
- *Developing and implementing the structure and policies of project management, engineering and procurement for the Fund,*
- *Technical assistance in developing the Fund's communication and management information system*
- *Coordinating all consultancy services employed by the Fund*

In order to strengthen the organization for the PTF projects, APC went into joint ventures with another consulting engineering firm, Integrated Engineering Associates in Kaduna. The partners of Integrated Engineering Associates were Suleiman Adamu, Aliyu Aziz, Hassan Umar and Muhammad Nura Khalil.

APC immediately set out in August 1995 to execute its assignment. In due course, APC became PTF's technical arm, providing professional advisory services to the Fund in the area of planning, procurement, supervision, monitoring and evaluation of projects, general project management and contracts administration. Between 1995 and 1999 APC, as the Fund's Management Consultant, was overseeing the services of 18 Zonal Consultants in project management, fund management and health management, as well as about 622 project consultants of various specialisations (architects (134), engineers (257), quantity surveyors (133), pharmacists (6), lawyers, media consultants, educationists, agriculturalists, public health experts, fund managers, accountants, etc.) from within and outside Nigeria. APC also assisted in the preparation and subsequent award and execution of nearly 10,000 contracts of various sizes, in roads construction, rehabilitation of health and educational institutions, water supply projects, dredging of River Niger and procurement contracts for supplies of books and instructional materials, pharmaceutical drugs and hospital equipment, mass transit vehicles and spare parts, etc.

In July 1999, the newly elected President Obasanjo instructed that the PTF operations be wound down. By this time, the PTF had a total commitment of more than =N=150 billion on various projects all over the country. APC stayed on to assist in the winding down process under a new PTF Interim Management Committee and finally resigned as Management Consultants to the Fund in December 1999.

At its peak, APC had over 350 employees, most of whom were graduate specialists and professionals, including university lecturers and offices in Abuja, Kaduna and Lagos. This is excluding its joint venture partners (Integrated Engineering Associates, Axis Consultants and Associated Cost Consultants).

The impact of the PTF projects on the ailing construction industry was massive. The partners of APC were young and aggressive, and had

a 'can do' approach to everything. Except for Dahiru, all the partners were in their mid-thirties, and their collective experiences belied the responsibilities they were willing to take. Through a cascading organisation of national, zonal and project consultants, they were able to impact on the whole country and all the sectors they targeted. All of them except one were from the construction industry, and perhaps this sector had the strongest impact. Coming from consulting background themselves, they believed totally in the use of consultants, and they mobilized the consulting industry to provide services in the execution of the programmes. The country was divided into zones, each zone to be managed by a consortium of consultants comprising architects, civil, electrical and mechanical engineers, and quantity surveyors. Zonal consortia then appointed project consortia made up of different professionals as required. The projects embarked upon varied from small and routine to the big and bold. They included the renovation of health care facilities to the dredging of the River Niger and National Urban and Rural Water Supply Schemes. The effect of all this was to wake up a business sector that was in a coma.

Perhaps the greatest lesson learnt from the PTF project experience is what can be achieved when professionals are given opportunities and challenged to perform. It is a model that needs to be carefully and thoroughly studied in our continued effort to develop our country, and this has not been done. We need to learn the positive lessons of this experiment and carry them forward.

Engineering Administration

There were five ministers of works in the nineties. Under Babangida were Major General Kontagora (1987-93) and Engr Gemade (Jan – Nov 1993). Under Abacha were Alhaji Lateef Jakande (Nov 93 – Feb 95) and Major General Kareem Adisa (Feb 95 – Dec 97), and under Abdusallam Abubakar was Major General Alli Muhammed (Jan 98 – May 99). There were no efforts made to strategise for the industry in this period.

The COREN President from 1991 to 1994 was Engr. I. K. Inuwa. His successor was Dr. M. A. Gulma who led the organisation from 1994 to 2001. Prof. R. I. Salawu was Registrar from 1991 to 1997 and was succeeded by Prof. E. I. E. Ofodile from 1997 to 2003. In 1992, the COREN Decree was amended to address issues that arose since its promulgation.

The COREN decree of 1970 had addressed mainly engineering graduates from universities. This, however, created a lot of problems in the construction industry. Graduates of Polytechnics, in particular, wanted to be registered as engineers, which COREN denied. Similarly, technicians and craftsmen were not covered by the decree. There was clearly a need for a more comprehensive regulation of the construction industry, and this called for a review and subsequent amendment of the COREN Decree.

The new decree gave COREN the responsibility not only to approve qualifications but also to supervise the courses of the instruction and examination leading to such qualifications. This meant specifying the qualifications so as to distinguish between the engineer and the technician, and to avoid such contradictions as the "technician-engineer" or "technological engineer". Perhaps this, as well as several others led to the change in the name of the organisation to Council for the Regulation of Engineering in Nigeria – a regulating agency and not just a registration agency.

COREN subsequently defined four categories of professionals within the construction industry as follows:

1. The Registered or Chartered Engineer with a minimum academic qualification of a university degree obtained from a recognised institution, or its equivalent plus appropriate experience. He took on the appellation of Engineer (Engr).
2. The engineering technologist, with WASC plus five years training in a polytechnic or College of Technology
3. The technician with WASC plus three years training course obtained from a recognized institution;
4. The artisan with minimum academic qualification of primary six and a minimum of three years' training in the relevant trade at the appropriate trade centre.

The Nigerian Society of Engineers had, by the nineties, become fully established. The president from 1991 to 1992 was Dr. F. A. Shonubi, who was a signatory to the original articles and memorandum of ACEN. He had lectured at the University of Lagos and was then running a consulting engineering practice, Mek-Ind Associates. He was succeeded by Engr. Vincent Maduka (1993 1994), an electrical/electronics engineer who had risen to become the Director General of the Nigerian Television Authority.

Dr. Olusegun Ajayi, who had also lectured electrical engineering at the University of Lagos and was a partner in the consulting engineering firm, Finco Associates succeeded Maduka and was president for only one year, 1995. Dr. E. J. S. Uujamhan, a mechanical engineer, succeeded Dr Ajayi and was president from 1996 to 1997. Uujamhan was running a consulting engineering firm, Oscar Jo Limited. The last president for the decade was Engr. C. A. Mbanefo, then a Director in the Federal Ministry of Works. He led the Association from 1998 to 1999.

ACEN in the Decade

The first president in this decade was Dr. Justus Olukayode Sonuga, who led the Association from 1989 to 1991. He was the first president who was not a signatory to the Articles and Memorandum of Association. Two honorary secretaries, Lanre Oyenekan (1986 – 90) and Ralph Eke (1991) worked with him. Two honorary treasurers Edet Amana (1987 – 90) and E. A. Babaniji (1990 – 1995) also worked with him.

Dr. J. O. Sonuga was born in November 1929 and graduated with a bachelor's degree from the University of London and a doctorate degree from King's College, London. He had his early training at the Public Works Department, PWD, from 1948 to 1954 and Taylor Woodrow (WA) Limited. He started lecturing in civil engineering at the Regent Polytechnic, London (from 1961), and later at the University of Lagos (1964 to 1976). He was a founding partner of ENPLAN Group in 1970.

Engr Sonuga worked assiduously to revise the scale of fees and produced the 1992 edition of the scale.

At the Council Meeting of 4th September 1990, ACEN Council approved and adopted a new structure for ACEN aimed at resuscitating ACEN activities outside Lagos by dividing the country into zones as follows:

Zone 1: Lagos State

Zone 2: Oyo, Ogun and Kwara States with centre in Ibadan

Zone 3: Kaduna, Katsina, Sokoto, Kano, Borno, Gongola and Plateau States with centre in Kaduna

Zone 4: Benin and Ondo States with centre in Benin

Zone 5: Benue, Anambra, Cross River, Rivers and Akwa Ibom States with centre in Enugu

The following terms of reference were given to the appointed zonal coordinators:

1. Prepare inventory of practicing consulting engineers in their respective zones, inclusive of non-ACEN members
2. Develop ACEN activities and functions within the zone
3. Assist in collecting membership subscription within the zone
4. Attend Executive Council Meetings

Engr V. O. Oyefodunrin, the Honorary Secretary at formation, assumed the position of president from 1992 to 1993. In 1992, Council took the decision to create the post of a vice president in order to adequately prepare the candidate for the position of president. Engr. Joseph Ibikunle Folayan, a previous honorary secretary was thus elected the first vice president of the Association. Engr. Debo Adeoye who had worked tirelessly with Songonuga in the formation of ACEN Insurance Company became the honorary secretary while Engr Babaniji continued as the honorary treasurer.

A new administrative secretary was appointed in the person of Kola Idowu, an English graduate from the University of Lagos. He remains with the Association till today. In order to generate more funds for running the Association, and to emphasise the business interest of its members, the Council formally introduced Firm Membership from January 1, 1994. Only firms whose partners were individual members of the Association were entitled to become firm members. There were really no additional privileges for firm members at this time, but the firms had to pay firm subscription in addition to the subscriptions of individual members.

Dr. Joseph Ibikunle Folayan became president in 1994 for a two-year term, which was later extended to 1996. The vice president was Aremo Kunle Okunnoren, the honorary secretary was Kunle Ogunbayo while Engr. Sogunro finally replaced Babaniji as the treasurer in 1996. Bayo Adeola was invited to be assistant secretary in 1995, although there was no constitutional provision for this post, and no other assistant secretary has since been appointed.

Dr Folayan had his secondary education at Titcombe College, Egbe, and did his 'A' level at the Federal Emergency Science School in Lagos. His first degree was from the University of Southern California, USA, and his doctorate degree was from Stanford University, Stanford, USA. He worked with Dames and More, San Francisco from 1966 to 1975 and rose to the position of Associate Partner. He formed the firm of Progress Engineers in 1971, a firm that he still runs till today.

With the severe slow down of the economy, interest in ACEN waned considerably, and turnout at ACEN functions became very poor. New members were not joining, and finances were poor. This situation led the president to set up a task force on the way forward for ACEN. The task force had a former treasurer, Supo Odumosu as its chairman, and Kunle Ogunbayo, Bayo Adeola and Chris Adegbola as members. The task force produced 'The Way Forward for ACEN', which served as the strategic plan for ACEN for the next few years. Excerpts from the report identifying some strategic objectives are as follows:

The Way Forward For ACEN

Three main issues were identified as the problems confronting the Association. Firstly, ACEN needed to be relevant to the Consulting Engineer. If it is made relevant, then members would not need to be persuaded to join. Secondly, ACEN needed to be accepted by a wider spread of Engineers. ACEN efforts to date seemed to be concentrated on protecting its members in their efforts to source work from Government. This is a noble effort. It must, however, be realized that it was being perceived in some quarters as an ethnic/ political objective, being dominated by Lagos-based consultants. Unless the basis of the protection is seen as strictly professional, the objective might be difficult to realize. Thirdly, ACEN must give value and respect to the Consulting Engineer.

An attempt was made to define the long-term objective of ACEN. This may be considered as our mission statement, and is as follows:

"To be the ultimate reference point for the practice of Consulting Engineering in Nigeria to the Consulting Engineer, in the face of the law, and in the eyes of the people".

In its responsibilities to the Consulting Engineer, ACEN needed to be able to achieve the followings:

Give service, especially in the collection of information on Consulting Engineering matters from all over the world, and disseminate such among its members.

Promote the Nigerian Consulting Engineer in all aspects of professional practice, including sourcing of work, technology development, training, and recovery of fees, among others; Define and sustain a high standard of Consulting Engineering practice, including a professional ranking of practice with respect to capabilities, finance and staff strength.

Create and sustain a harmonious and co-operative working environment among its members, including the formation of consortiums for execution of projects; support and give assistance to members during lean periods; and organize facilities with financial institutions for the funding of consulting engineering practice, insurance and retirement benefits.

Give the Consulting Engineer a social status worthy of respect and admiration, and an incentive to the coming generation of engineers that Consulting Engineering is a worthwhile endeavour.`

In its responsibility to the public at large, it needed to create an image of an Association of professionally competent engineers, with high moral and ethical values in the discharge of duties; an Association able to enforce discipline among its members, and as such, able to protect the public from the consequences of professional misconduct, incompetence and abuse.

Statutorily, ACEN would want to be recognized by COREN and NSE as a partner for the regulation of Consulting Engineering practice, be recognized by government agencies as the pool from which all consultants for government-sponsored projects must be drawn, be the representative of the practice on all matters including fees negotiations, arbitration and the development of Conditions of Contract

In essence, ACEN would want to be the recognised body for the regulation of consulting engineering practice in Nigeria.

In order to meet these objectives, ACEN needed to have a properly equipped permanent secretariat manned by competent staff led by an executive secretary of the calibre of no less than a Director General.

These recommendations were accepted by the ACEN Council and efforts at establishing a permanent secretariat commenced. Members of the Association were requested to donate towards the rent and staff salary and many willingly obliged.

Aremo Kunle Okunoren succeeded Folayan and led from 1997 to 1999. The vice president was Dr Agbim, the honorary secretary was Kunle Ogunbayo (1995-1996), succeeded by Bayo Adeola (1997-1999) while the treasurer remained Sogunro.

The major achievement within the context of the Way Forward for ACEN in this period was the movement to the permanent secretariat at 5th Floor, Crusader House, 16 Commercial Avenue, Yaba in 1998. For the first time since its formation in 1971, ACEN now had its own address, independent of its presidents and secretaries. Two additional staff, a secretary and a dispatch clerk were recruited, bringing the permanent staff to three. This was a major achievement as members had to pay special levies for the rent and furnishing of the secretariat. Changes made to the articles and Memorandum of the Association include limiting the tenure of the president to two years, and that of Council members to three years. These two changes allowed the inflow of new members, and consequently, new ideas into the Council and its proceedings.

Nigeria hosted the Annual Conference and General Meeting of the Group of African Member Association, GAMA, of FIDIC for the first time in Abuja in 1998. Nigeria had been a major player in the formation of this group, but had been reluctant to host the Association for three major reasons. The first was the quality of infrastructures available in Lagos for such a conference. The second was the level of security in the country as a whole and third was whether delegates from other countries would be willing to come to Nigeria giving the political situation. The ultra-modern facilities available in Abuja and its high level of security solved the first and second concerns. Despite all reassurances, however, only three countries, Egypt, Uganda and Zimbabwe, turned up for the event. The conference was very successful and all delegates and participants acknowledged that Nigeria had set a new standard for GAMA conferences.

The fifth leg of engineering development, engineering education, continued to suffer greatly in the nineties. At the founding of the leading engineering institutions in the country, international bodies had been

involved, and there was enough money to maintain the standards in the seventies. By the nineties, intake into the universities had increased ten-fold, while the laboratory and educational facilities had deteriorated and several had become obsolete. The conditions of service for the lecturers had failed to catch up with the cost of living and most lecturers were living in appalling conditions. Worse still, they did not have the facilities to carry out research.

Most lecturers with international qualifications left Nigeria for international appointments, and first-class graduates refused to take up appointment in the universities. The quality of lecturers therefore became poorer over time, to the point that quality research was no longer coming out of Nigerian universities. Unlike the sixties, seventies and early eighties when Nigerian university lecturers were as good as the best in the world, only the die-hard academician or those who did not have alternatives remained in the universities. Strikes by lecturers over poor conditions of service and teaching facilities were frequent, with not much result.

Although there was still interest in the profession among young people, engineering had stopped attracting a significant percentage of the best students. The quality of life of practicing engineers was very poor compared with their colleagues in banking, management consulting and information technology. Even when driven by their competencies in mathematics and physics, they studied engineering in the university, they did not stay in the profession and migrated to other sectors via the MBA and other programmes. Again, unlike the sixties, seventies and eighties when the best students studied engineering and stayed in the profession, the nineties saw fewer first-class students studying engineering, and fewer still staying in the profession.


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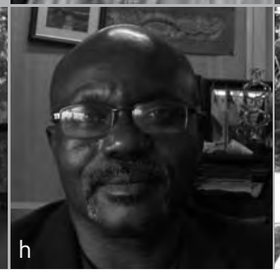
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CHAPTER 8

NEW MILLENNIUM, UNREALISED DREAMS

Images a - r: Officers of ACEN in the nineties
a. Edet Amana, President 2004/05
b. Lanre Sagaya, President 2002/03
c. Bade Oke, Executive Secretary 2007/08
d. Ayo Akindiji, Hon Secretary
e. Kola Idowu, Admin Secretary
f. Kunle Ogunbayo, Vice President
g. Mayen Adetiba, President 2006/07
h. Ore Fadayomi, Hon Secretary 2002
i. Nurudeen Rafindadi, Vice President 2009
j. RO Shoderu, Vice President 2002
k. Bayo Adeola, President 2008/09
l. Ashim Oyekan, Hon Treasurer 2006/07
m. Kabir Umar, Vice President 2008
n. MO Adeshina, President 2000/01
o. Yomi Lawson, Hon Secretary 2003/04
p. Tunde Ogunde, Hon Treasurer 2008/09
q. Tunde Amode, Executive Secretary, 2009
r. Temilola Kehinde, Vice President, 2006/07

Image above: Rural Transport in Ogun State.
Source: CPMS Report 2005

Abubakar's tenure ended in May 1999. General, now Chief Olusegun Obasanjo was elected president, and his party, the People's Democratic Party (PDP), won a majority of the seats in both the Senate and House of Representatives, amidst the ever-present allegations of election irregularities. Fifteen years of military rule had come to an end, and Nigeria entered the longest period of civilian rule since independence.

Reception for Obasanjo by the populace was mixed. Some felt that it was a recirculation of the military and not true democracy. A significant percentage of the Yorubas in the south west still could not forgive him for the enthronement of Shagari in 1979, and he did not have popular support in what should have been his home base. Others felt that he was being sponsored by the northern caucus. There was the general expectation, however, that having been a head of state before, he should be able to steer the ship of state steadily and lead to progress. There was also the expectation that, having just escaped death under the Abacha government, he should be a renewed person. Supporters and sceptics together, there was an air of expectations at the beginning of this fourth republic.

The political environment in the decade was very stable, considering the turmoil and chaos of the previous three decades. Nigerians had experienced military governments of different shades and had become persuaded that the leadership and governance solutions were not with the military. There was a new commitment to democracy.

Three main factors influenced the economy. The first was that the price of oil continued to increase for most of the decade, to reach a high of nearly $150 per barrel in 2008 from $16 per barrel in 1999. This provided the needed income for development. The second was that Nigeria still carried a considerable amount of foreign debt, the servicing of which proved onerous. The Obasanjo administration aggressively addressed the debt issue and eventually resolved it. The third was that massive and pervasive corruption continued to undermine both the politics and the development of the country, and Obasanjo also set out to address corruption.

In January 1999 the price of a barrel of oil reached a low point of $16 when Iraq increased its oil production at the time of the Asian financial crisis when demand for oil fell. Prices thereafter increased rapidly, reaching $35 in September 2000, $40-50 by September 2004, $60 in June 2005, and by early August 2005 it hit $65 as consumer demand was maintained mainly by demand from China and India. In September 2007, oil price broke the $80 barrier, and in October 2007 exceeded $90 for the first time, due to a combination of tensions in eastern Turkey and a fall in the value of the US dollar. The next psychological watershed of $100 was breached in early 2008, exceeded $110 on March 12, 2008; $125 on May 9, 2008; $130 on May 21, 2008, $140 on June 26, 2008 and $145 on July 3, 2008. The record was reached on July 11, 2008 at $147.27 as a consequence of geopolitical tensions over Iranian missile tests.

Rather than spend the excess oil revenue as it came in, the Obasanjo administration adopted a disciplined fiscal policy and de-linked oil revenue from expenditure. Irrespective of the increase in oil price, the country maintained prices of $25, $30 and $35 per barrel for 2004, 2005 and 2006 budgets, respectively. Any revenue above this price was saved in an Excess Crude Oil Account. In a short time this amounted to a considerable sum, which was subsequently available for paying off Nigerian debt to the Paris Club and for investment in the power sector. Foreign reserve rose from $7 billion at the end of 2003 to $17billion and $28.3billion at the end of 2004 and 2005, respectively. By 2008, it had reached $60 billion. Nigeria's credit rating in world trade improved considerably.

Obasanjo also aggressively embarked on the task of resolving the country's debt crisis and finally reached a milestone agreement with the Paris Club of lending nations in 2005 and a similar agreement with the London Club of Lending Nations. In 2006, Nigeria succeeded in eliminating almost all of its external debt. The agreements consisted of a combination of debt forgiveness and repayment from the country's energy revenues.

The debt relief was, however, received with mixed reactions. Many felt that the western creditors had been too severe on Nigeria. They felt that much of the debt could be attributed to irresponsible borrowing and lending by both the borrower and lenders, and exorbitant interest rates and penalties for defaults, and only the borrower was being made to pay the penalty.

By 1970, despite just coming out of the war, Nigeria's external debt was less than US$1.0 billion. By 1985, due to borrowing mostly under the military governments, external debt had climbed to US$19 billion, much of it on non-concessionary terms, and debt servicing had increased to

US$4.0 billion per annum or 33% of exports of goods and services. Much of this borrowing was spent on failed projects often promoted by the lender countries. In the 1990s, the military government cut off relations with its Paris Club creditors and the debt ballooned. By 2004, with original loan of US$17 billion, the country had repaid US$18 billion and still owed US$34 billion.

The final deal reached offered a cancellation of 60% of Nigeria's bilateral debt amounting to US$18 billion, if Nigeria paid up the outstanding 40%, or US$12 billion, within six months. It was the largest debt deal secured by any African nation.

Some of the reactions of those who considered the deal as unfair to Nigeria were captured in the article on Jubilee Debt Campaign website, www.jubileedebtcampaign.org.uk/Nigeria:

> *"As we applaud your unequivocal leadership in the fight against poverty in Africa, we encourage you to actually put your policy commitments into action by not accepting the US$3 billion due to your government as an example, and prevailing on other Paris Club countries to do the same."*
> *Nigerian Civil Society organisations in an open letter to Tony Blair, December 2005*

> *"US$12 billion in Nigeria would have gone a long way towards saving children, immunisation, healthcare, all kinds of things. But the donors got greedy. They said, 'Take the oil revenue that you have responsibly been saving up, and instead of investing it in your needs, give it to us.' To the donors I say 'Return that money. Where is it needed? Not in our coffers."*
> *Jeffrey Sachs in reflection of the debt deal, November 2005*

> *"The people who gave these loans knew that the money was not being spent wisely. Perhaps they even took their own cut. Yet the ordinary people of Nigeria have to pay back the loan ... This is the injustice of it all."*
> *Former President Obasanjo addressing the House of Representatives, 2005 .*

> The Director of Portfolio Management in the DMO, Dr. Abraham Nwankwo described the Paris Club as a "debt enhancing" not "debt reduction" association. "Experience has shown that [a Paris Club agreement] only succeeds in keeping debtors in a vicious circle of heavy burden" he said.

The third factor that was aggressively addressed by Obasanjo was corruption. The campaign against corruption, which included the arrest of officials accused of misdeeds and the recovery of stolen funds, won praise from the World Bank. In September 2005, Nigeria, with the assistance of the World Bank, began to recover US$458 million of illicit funds that had been deposited in Swiss banks by the late Head of State, Sani Abacha. However, broad-based progress has been elusive and has not yet become evident in international surveys of corruption. In fact, Nigeria ranked 147 out of 179 countries in Transparency International's 2007 Corruption Perceptions Index and placed 108 out of 178 countries in the World Bank's 2008 Ease of Doing Business Index. This is consistent with general opinion within the country that not much progress has been made in the effort to reduce corruption.

The country is thus left with two major problems: corruption, which is recognised but for which there is not enough political will to address; and the lack of competence which is generally ignored and not addressed.

Development Strategies

Three development programmes were presented in this decade. The first is the United Nations Development Programme, UNDP, driven strategy to lift the quality of life in poor nations. This programme set specific targets for key human resources development parameters, and set a time line of 2000 to 2015 to achieve them. This is well known as the Millennium Development Goals, MDG. These include poverty reduction, education, gender equality, health, the environment, and international development cooperation. In an update released in 2004, the UN found that Nigeria was making progress toward achieving several goals but was falling short on others. Specifically, Nigeria had advanced efforts to provide universal primary education, protect the environment, and develop a global development partnership. However, the country lagged behind on the goals of eliminating extreme poverty and hunger, reducing child and maternal mortality, and combating diseases such as human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and malaria.

The second is the National Economic Empowerment and Development Strategy, NEEDS. The purpose of NEEDS was to raise the country's standard of living through a variety of reforms, including macroeconomic stability, deregulation, liberalization, privatization, transparency, and accountability. NEEDS sought to address basic deficiencies, such as the lack of freshwater for household use and irrigation, unreliable power supplies, decaying infrastructure, impediments to private enterprise, and corruption. The government hoped that NEEDS would create 7 million new jobs, diversify the economy, boost non-energy exports, increase industrial capacity utilization, and improve agricultural productivity. A related initiative on the state level is the State Economic Empowerment Development Strategy (SEEDS).

After taking office in May 2007, President Umaru Musa Yar'Adua embraced a policy known as Vision 20-2020 to transform Nigeria into one of the world's top-20 economies by 2020. Vision 2020 envisaged the enactment of a "Seven-Point Agenda," consisting of power and energy infrastructure; food security and agriculture; wealth creation and employment; mass transportation; land reform; security (including bringing stability to the Niger Delta); and education.

None of these plans have adequate provisions for the strategic development of local capacity.

Engineering in the Decade

President Obasanjo raised high expectations and promised considerable improvement in infrastructures. The comatose power supply in the nation would be aggressively addressed and steady power provided. The highways would be repaired and made motorable, ports would be revamped and the railways, which had been ignored completely since independence, would be re-constructed. With political stability and high oil prices, we were poised for technological take-off. Indeed, a lot of effort was put into trying to get these infrastructures to work as demonstrated by the few examples below

Power Sector Development

As at 1999, the National Electric Power Authority (NEPA) was the wholly owned government utility solely responsible for generation, transmission and distribution of electricity for public consumption in the Nigeria. The power sector was in a comatose state with irregular, inadequate and fluctuating power supply characterised by frequent outages. The total installed generation capacity in 2000 was about 5,876 MW, but less than 50% was available at any point in time. Private generation was estimated at millions of dollars, mostly on diesel-powered generating sets. Only 40% of the population had access to electricity. The Federal Government produced an Action Plan in 1999, which aimed to bridge the power deficit, resuscitate the power sector and ensure reliable power supply by the end of 2001. In order to achieve its targets the Federal Government mobilised financial and management resources to NEPA. Budgeted expenditure for the sector in 2001 was =N51= billion. This was not achieved.

This short-term programme included emergency power plants (EPP), rehabilitation of existing power stations as well as reinforcement and expansion of the existing distribution network for effective service delivery. There were also plans to reinforce transmission and distribution substations to ensure that power generated was effectively transmitted and distributed. In the medium to long term 2000MW of power was expected to be generated by independent power producers (IPP) to further augment power supply. The Government planned to open up the sector to competition, deregulation, rehabilitation and privatisation by 2003. The privatisation process would entail sale of generating stations, split up of the distribution sub-sector into private regional sectors while transmission would remain a public sector activity. By the time of change of government in May 2007, installed capacity remained about 6,000 MW, generated power remained less than 4,000MW and often less than 2,000MW, about US$13.5 billion had been expended, eight years had passed, and power supply remained epileptic and inefficient.

President Yar'Adua on assumption of office set up various committees to look into the state of power supply in Nigeria in 2008, and a target was set to move the power supply in the country from the then under 3,000MW of available power supply to 20,000MW by 2020. According to the Dr. Rilwanu Lukman-led Presidential Committee's report, a sum of US$85 billion would be required in capital investments to achieve this objective. This is in addition to the over US$13.5 billion already expended.

Oil & Gas

One of the major policy thrusts of the Obasanjo administration was the introduction of the local or national content policy in the oil and gas sector in 2005. The objective was to create a platform for the country to maximise the opportunities in the sector as well as improve the

linkages of the sector to the domestic economy. The need for this policy can be best appreciated from the fact that since the industry commenced operations fifty years ago we have built four refineries, three petrochemical plants, over five thousand kilometres of pipelines, six LNG trains, four Floating Production Storage and Offloading Vessels, FPSOs, hundreds of oil platforms, thousands of wells and flow stations and millions of square kilometres of seismic data have been acquired. In the last 20 years alone, the industry has generated total revenues of some US$300 billion while industry spending has grown to some US$12billion annually in the last 5 years. Despite this activity level, the local content in the industry was at the time less than 5%, and mostly in the none-technical areas. This could be compared with Malaysia and Brazil with about the same length of time of oil exploration but with local firms fully in control.

The Nigerian Content Development Policy attempts to correct this anomaly by stipulating activities of the sector that must be carried out within Nigeria to bring about rapid development of skills and capacity in the domestic environment. In 2006, NNPC introduced twenty-three domiciliation guidelines, setting out the scope of services that must be performed in Nigeria if the Government's target of 70% National Content by 2010 was to be realized. These areas included Engineering Design, Fabrication, Wells and Drilling, Operations & Maintenance, Manufacturing, Shipping and Insurance. The engineering objectives of the National Content programme by NNPC included the creation of jobs and facilitation of large engineering companies through increased domiciliation of more engineering man-hours.

Telecommunications

Tremendous progress was made in the area of telecommunication in the decade, and this was indeed perhaps the most successful area in infrastructure provision by the Obasanjo administration. By 2008, Nigeria had over 64 million active telephone lines. The tele-density increased from less than 1% in 2001 to 46% in 2008.

Two technologies combined to drive this industry. These are telephony, including the development of optical fibre cables and satellite technology; and advances in computer technology that have made high capacity available at relatively low cost. Nigeria has made advances, not only in the end product of telephones, but also in trying to acquire telecommunication and computer technologies. In 2004 Nigeria launched a communications satellite with Russian assistance and another one for surveillance and communication in 2006. Satellites and Optic Fibre Communications System (SAT-3/WASC/SAFE) is being developed. The first leg will link Europe with South Africa and a number of countries in the West African Coastline. The second leg (SAFE-South Africa for East) continues for another 13,800 km to Malaysia via Reunion and Mauritius with a landing in India and onwards to Australia and the Asian Pacific region. This development will significantly improve Africa and Nigeria's connectivity to the world by eliminating the reliance of most African countries on foreign operators to route their international traffic. Nigerian companies are also increasingly involved in computer manufacture and software development.

Roads & Highways

One of the benefits of the infrastructural development of the 1970s was that by 1999, Nigeria had a very wide network of roads and highways with over 113,000 km of tarred roads with about 20,000 km of them as dual carriage express roads. However, due to neglect and poor maintenance culture, most of them were in a severe state of disrepair. The government aggressively sought to address this and in 2002, set up the Federal Road Maintenance Agency, FERMA under the chairmanship of a retired permanent secretary in the Federal Ministry of Works, Engr Guy Otobo. According to FERMA's own records from its website, some of their achievements include the following:

The Agency embarked on the "Operation 500 Roads" programme in March 2004 with the aim of undertaking massive repairs and maintenance of 500 selected roads covering a total of 26,400 km of road network before the commencement of the 2004 rainy season.

Since inception, the Federal Roads Maintenance Agency has committed a large amount of money to direct labour operations nationwide, covering over 100 major roads of which approximately 95% have been completed.

So far, a total of 2,374 road maintenance projects have been embarked upon by the Federal Roads Maintenance Agency through a form of regular maintenance contracts from inception to date.

The Agency has awarded 391 jobs to reputable contractors with asphalt plants along selected routes to carry out continuous

repair/maintenance works on long stretches of 308 Federal roads nationwide for durations of at least one year and renewable annually depending on the performance of the Contractor. Substantial physical accomplishment has been achieved by the majority of the contractors.

The 40 No. newly acquired 4-9 TPH asphalt plants are now in use for direct labour operations in all 36 states of the Federation including the FCT and the three highway training schools in Kaduna, Ugoneke and Badagry. Installation of 7 No. newly acquired 60-70 TPH asphalt plant is in progress. Also approval has been granted by the Honourable Minister to lease out the 60-70 TPH asphalt plants.

There is no doubt that some progress was made by this effort, however, Nigerian roads remain in a state of significant disrepair and much more needs to be done.

Sea Ports

The Nigerian Ports Authority (NPA) is responsible for managing Nigeria's ports, which have fallen behind international standards in terms of the quality of facilities and operational efficiency. Recognising that the government lacks the funding and expertise to modernise facilities and to run the ports efficiently, the NPA is pursuing partial port privatisation by means of granting concessions to private port operators. Under the terms of concession agreements, the government has begun to transfer operating rights to private companies for 10–25 years without relinquishing ownership of the port land. Nigeria's principal container port is the Lagos Port, which consists of separate facilities at Apapa and Tin Can Island and has a rail connection to points inland. Lagos Port, which has a container handling capacity of 22,000 twenty-foot equivalent units (TEUs), handles two-thirds of Nigeria's non-oil trade. The main petroleum outlets are Delta Port Complex, including Burutu, and Port Harcourt, a trans-shipment port. Relatively modern and efficient onshore and offshore terminals managed by multinational oil companies handle most oil and gas exports.

The Railways

By 1999, the limited railway infrastructures were aged and run down, and operation was comatose. A lot of energy was put into the sector. By 2007, however, not much had happened. As of 2006, Nigeria's poorly maintained rail system consisted of 3,505 km of narrow-gauge track.

The Obasanjo's administration approach to this was to engage the Chinese. In a website article on ipsnews.net/news.asp?idnews=36432, Toye Olori wrote, inter alia, as follows:

In October 2006, the government signed a US$2.5 billion loan facility with China, a substantial part of which will be used to finance the refurbishment of the railway system. In all, an estimated 7,800 km of standard gauge railway network, to connect all 36 state capitals and major cities in the country, will be built by concession-holders, which then will be responsible for infrastructure upgrades, expansion and maintenance, and train operations.

The contract for the first phase covering 1,315 km of double-track, standard gauge line (1,435mm) from the commercial centre of Lagos in the southwest to Kano in the north - with a branch from Minna (central Nigeria) to Abuja, Nigeria's capital - was signed on October. 30, 2006 by Nigeria and the CCECC. The estimated contract sum for this phase of the project is put at 8.3 billion US dollars.

This attention to infrastructures by government is to be commended. However, it fell severely short in the lack of focus on the development of local capability and capacity.

While all these plans are going on, the procurement policy with respect to the development of local capacity in engineering and technology may be described as retrogressive, and at best confusing. Somehow, the government expects the private sector engineers to compete with international firms without active support from their home government. Ministers and chief executives of engineering-driven parastatals remain non-engineers without definite strategy and operational guidelines to deliver on specific objectives. Reliance on foreign expertise and funding still dominate the provision of infrastructures on the grounds of experience, funding and guarantee of delivery. Projects continue to cost much more than they should because of corruption and the cost of foreign experts. Corruption remains endemic on contracts. Meanwhile, Nigerian engineering graduates remain largely unemployed or under-employed, and consulting engineering firms remain small and difficult to sustain.

The Chinese have now replaced the European and American firms in the provision of infrastructures. The projects are awarded on a turnkey

basis and the designs, procurement and construction are carried out by the Chinese. With the language barrier, no technology transfer takes place, and the Chinese come with all the staff they need. The only interface is the translator.

Why is the local content policy limited to the oil and gas sector only? The PTF experience was not without its merits, how can the best practices learnt from it be further developed? These are questions begging for answers.

A major development in the decade is the return of donor agencies of foreign governments to the Nigerian scene. For most of the eighties and nineties, Nigeria was considered a pariah state and most of the funds were not available. With the return of the country to democracy and solvency, the country was re-classified and several foreign-sponsored projects are now being implemented. These tied-aids remain major threats to the development of local capacity and capabilities. They provide the cushions for foreign firms to enter the country and fully exploit the opportunities far beyond the original investments.

Engineering Administration
Seven ministers have headed the Ministry of Works and Housing in this decade. Under Obasanjo were Chief Tony Annenih (June 1999 – Nov 2002), Chief Madaki Alli (Nov 2002 – May 2003), Senator Adeseye Ogunlewe (June 2003 – March 2006) and Chief Cornelius Adebayo (Nov 2006 - 2007). There has been only one minister under Yar'Adua, Dr. Hassan Lawal (2007 - date).

COREN had two presidents, Engr. Ebenezer B. Osoba from 2001 to 2003, and Engr. Habu Gumel from 2004 to date. It had three registrars: Professor Ofodile from the previous decade, Prof Olumide Ajose from 2003 to 2007, and Felix Atume from 2007 to date. COREN's major focus in this decade was the implementation of the Students Industrial and Works Experience Programme, SIWES in addition to the registration of engineers and holding of Annual Engineering Assemblies.

The Nigerian Society of Engineers had five presidents: Engr Habu Gumel (2000-2001), Engr. F.A. Somolu (2002 – 2003), Engr. M. Bulama (2004 – 2005), Engr. E. M. Ezeh (2006– 2007), and the incumbent, Engr. Kashim Alli (2008 – present).

ACEN in the Decade
Otunba Michael Olusegun Adesina served as ACEN president from 2000 to 2001: The vice president was Lanre Sagaya. There were two honorary secretaries: Bayo Adeola (2000) and Ore Fadayomi (2001). The honorary treasurer was E. G. Sogunro.

Michael Olusegun Adesina had his secondary school education at Olu-Iwa College, Ijebu-Ode and Abeokuta Grammar School, Abeokuta. He had his first degree in Civil Engineering from Ahmadu Bello University, Zaria in 1963, a Diploma in Sanitary Engineering from Delft, Netherlands in 1969, and a Masters degree from the University of Ibadan in 1984. He started his working career with the Ministry of Works and Transport in the old Western Region where he worked from 1963 to 1967. He transferred from there to the Water Corporation in 1967 where he worked till 1972. He resigned and formed his consulting firm, Sshwed Associates in 1972, a firm he still runs till today.

Otunba Adesina assumed office just after the new civilian administration was sworn in. He was thus the first ACEN president to serve a full term after fifteen years of military rule. The major thrust of ACEN was trying to get the federal government to adopt a more positive attitude to the patronisation of local consultants and create a positive environment for consulting engineering practice to thrive. In this respect, visitations were made to the Vice President, Atiku Abubakar and the Minister for Works and Housing. The Extra-ordinary General Meeting was attended by the Minister for Communications, Chief Haruna Elewi, who addressed ACEN members on the opportunities available in his ministry and the need for consulting engineers to be more responsive to government programmes. The Association also invited the African Development Bank to conduct workshops on the opportunities for consultants and methods of preparation and evaluation of proposals in the Bank.

The Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture, NACCIMA, was another Association in which Adesina was involved and he got ACEN to become a full member. This is an association that covers very broad areas of businesses and has stronger recognition from government for its activities. ACEN joining NACCIMA made the resources of the association available to it.

The representation of ACEN on the board of ACEN Insurance Company transferred to Adesina on his assumption of the presidency. He thereafter

remained the ACEN representative on the board of the company until its demise in 2008.

Yusuf Olanrewaju Sagaya succeeded Adesina and was president from 2002 to 2003. He had two vice presidents, Chief R A Soderu for 2002, and Mayen Adetiba for 2003. There were two honorary secretaries, Ore Fadayomi in 2002 and Yomi Lawson in 2003. E. G. Sogunro remained the honorary treasurer.

Yusuf Olanrewaju Sagaya had his secondary education at Government Secondary School, Ilorin from 1960 to 1966. He had his university education at Ahmadu Bello University, Zaria, from 1967 to 1970 and graduated in Civil Engineering. Upon graduation, he worked with Ove Arup and Partners from 1970 to 1972 and Osot Associates from 1972 to 1973. He proceeded to Canada and obtained his Masters Degree in Civil Engineering from the University of Ottawa in 1975. In 1976, he formed his first consulting firm, Landscope Consultants, in partnership with two friends. He resigned from Landscope in 1980 and formed Yolas Consultants, the firm he still runs till today.

While Kunle Okunoren was president, the need to celebrate the hand-over of tenure from one president to the other had been raised, and it had been agreed that a formal investiture of presidents would be instituted. Lanre Sagaya was the first president for whom a formal investiture was organised. Chaired by the chairman of ICPC, Justice Mustapha Akanbi, a well-attended formal investiture took place at the Agip Recital Hall of the Muson Centre on Thursday 4th February 2001.

A very amiable gentleman with excellent interpersonal skills and network, Lanre Sagaya sought to improve the lot of ACEN members in several ways. He continued the policy of lobbying the federal government for the patronage of Nigerian consulting engineers and led visitations to President Obasanjo, Vice President Atiku Abubakar and Ministers, and used the opportunity to appeal to them to consider ACEN membership as a condition for consultancy works in their ministries. He concluded the production of the Procurement Guidelines for Consulting Engineering Services, a document that eventually provided significant input into the National Procurement document. He promoted zonal offices, pursued aggressive membership drive, and encouraged the formation of consortiums among members. He also promoted excellent relationship between ACEN and NSE and COREN.

Edet Amana had been active in ACEN in the early years of its formation and was honorary treasurer from 1988 to 1990. He had, however, stayed away from ACEN Council for several years while engaged in national politics during which he sought nomination as his country's presidential candidate of his party. In 2002, he returned to active participation in ACEN activities and was elected as council member. In December 2003, he was elected president for the period 2004 to 2005. Kunle Ogunbayo was vice president. Yomi Lawson continued as honorary secretary but had to resign after six months to take up the chairmanship of his Rotary Club. Ayo Akindiji came in as acting honorary secretary for the remaining six months. He thereafter was elected to Council in his own right and served as honorary secretary for Amana's second year as president. Ogunlowo-Bolaji was elected honorary treasurer.

ACEN had for several years been unable to engage an executive secretary. The 'Way Forward for ACEN' prepared in 1995 had identified this as one of the critical gaps that must be filled if ACEN was to realise its vision and fulfil its mission to its members. The major challenge was ACEN's ability to pay appropriate salary on a sustainable basis. In 2004, ACEN members made pledges to donate towards the remuneration of an executive secretary.

Mr Isaac Abayomi Olomolaiye was engaged as the first executive secretary of ACEN in January 2005. Mr. Olomolaiye was born in Ilesha in 1957 and obtained his bachelor's degree in sociology from the University of Ibadan in 1979. Thereafter, he worked in the federal civil service and rose from the position of Administrative Officer in 1981 to Assistant Director in 1992. He retired from the service in 1995 and worked for Chris Ogunbanjo Foundation in Erunwon before joining ACEN.

Edet Amana had his secondary school at Methodist College, Uzuakoli, and King's College, Lagos. From there he proceeded to the Imperial College, London, where he obtained his first degree in Civil Engineering in 1963 and his doctorate degree in Structural Engineering in 1967. He served his pupilage at Flint and Neil Consulting Engineers and Sir Bruce White Wolfe Barry and Partners, both in London. On his return to Nigeria, he joined Shell Petroleum where he worked till 1972. He then set up a consulting firm, Amana Consulting Engineers.

Edet Amana was an ideas man, and he introduced several new ideas into ACEN. Immediately after his inauguration, he organised and partly

funded a retreat of ACEN council members to deliberate on the future of ACEN. Some of the ideas he introduced during his tenure include the establishment of an ACEN School of Consulting Engineering, development of a Resource Centre, and the writing of the History of ACEN. Amana's operational method was to assign tasks to individuals, who often let him down by not delivering on the tasks. Although not many of his ideas could be achieved during his tenure, they provided a platform for the future of the association. During his tenure, Nigeria hosted the Group of African Member Association's conference for the second time. This time, the turn-out was much better with FIDIC president Dick Kell and six other countries in attendance.

Engr. Mrs. Mayen Adetiba had been active in ACEN for several years and had always offered herself for leadership. In December 2005, she was elected the first female president of ACEN for 2006 and 2007. Temilola Kehinde was elected as vice president while Ayo Akindiji continued as honorary secretary. Ashim Oyekan took over from Ogunnowo-Bolaji as treasurer. The executive director, Isaac Olomolaiye, completed the executive committee. Isaac Olomolaiye resigned in August 2006 after less than two years, and Engr Jibade Oke took over as executive director.

Bade Oke was born in 1948 and had his secondary education at Ilesha Grammar School and Government College, Ibadan. He graduated in mechanical engineering from the University of Lagos in 1972 and worked with Dunlop Nigeria PLC, rising to the position of an executive director of the company. He retired from Dunlop in 1999.

ACEN's first female president had her secondary education at Reagan Memorial Baptist Girls' College, Yaba, Lagos from 1964 to 1968. From there she proceeded to New York where she had her first degree in Civil Engineering at the Columbia University in 1975. She then proceeded to Cornell University where she had her Masters Degree in Structural Engineering in 1976. She started her engineering career with Structeng Associates from 1976 to 1978, Dutch Consulting Engineers, DHV 1978-80, and O. Ogunsola and Partners, 1980 – 83. She resigned to form her own firm, Delkem Associates in 1983.

Mayen Adetiba introduced her own brand of energy. The starting point was her investiture. The chief guest of honour was no less than the head of state, Chief Olusegun Obasanjo, and the chairman of the occasion was another former head of state Chief Earnest Sonekan. The event was a luncheon on a Sunday and the guest list was a list of who is who in the Nigerian female social circle. Several women associations came to identify with and celebrate one of their own.

Adetiba organised several visitations, including visits to President Obasanjo in February 2007 and Senate President David Mark in December 2007. She strongly believed in the need for capacity building among consulting engineers in Nigeria and organised training workshops including FIDIC training, BEME, etc. She also used her network to provide necessary assets including furniture and computers for the ACEN Secretariat. In 2005, the Obasanjo administration had introduced a National Content Policy which required greater domiciliation of works and services in the oil and gas industry in Nigeria. ACEN organised workshops facilitated by NNPC to introduce and educate members on this policy.

The last president for the decade, Bayo Adeola, was elected in December 2007 for the years 2008 and 2009. Two vice presidents, Kabir Umar for 2008 and Nurudeen Rafindadi for 2009 served in the period. Engr Tunde Ogunde was elected as honorary treasurer. With the employment of executive secretaries, the post of honorary secretary was aborted and Engr Jibade Oke continued as executive secretary until June 2008 when he resigned but offered to continue as acting secretary without pay until a new executive secretary was appointed. Tunde Amode was subsequently employed as the new executive secretary in January 2009. For continuity, Jibade Oke was co-opted into Council and appointed honorary secretary to be able to properly induct the new executive secretary.

Bayo Adeola had his secondary education at King's College Lagos and his university education at the University of Lagos and Imperial College London. On graduation, he worked with the consulting firm of Adeyemi Ogundipe and Partners from 1976 to 1984. In 1984, due to the economic crunch arising from the fall in oil prices, a Lagos arm of Adeyemi Ogundipe and Partners, AOP-Consult Limited was formed with Bayo as one of the partners. He retired from AOP in December 1997 to form his current firm, Comprehensive Project Management Services Limited.

The final component of engineering development is education, and a lot of effort was put into regularising and stabilising education development in the decade. At the primary and secondary school levels, the Obasanjo

administration restored considerable order and revamped the schools. The federal and state universities remained challenged with funding and increasing population demand which overstretched their facilities. Compared with the eighties and nineties, however, they remained relatively stable and some sense of order restored. There are presently twenty eight universities listed in Table 5 offering engineering courses in the country. The challenge of engineering education, however, remains the quality of infrastructure, equipment and teachers.

A major development in the decade is the emergence of private owned universities, mostly by religious organisations. This has significantly increased the opportunities available to young people to acquire tertiary education and brought some level of stability to university programmes. Unfortunately, because of the level of infrastructures required, most of these universities are unable to offer engineering courses. Only Covenant University, Ota is a private university of all the twenty eight listed above.

Table 6 shows the list of members and Council of ACEN from 1971 to 2009 with the Officers of Council and their posted highlighted.

Table 7 shows the Administrative Officers and Executive Secretaries.

Table 5 Engineering Accredited Universities in Nigeria, 2008

UNIVERSITY	PROGRAMMES
1. Lagos State University, Epe Campus	a. Mechanical Engineering b. Chemical/Polyer Engng. c. Electronics/Computer Engng.
2. Federal University of Technology, Akure	a. Agricultural Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Materials/met. Engineering e. Mechanical Engineering f. Mining Engineering
3. Ahmadu Bello University, Zaria	a. Agricultural Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Water Resources & Environ. e. Mechanical Engineering f. Materials/Met. Engineering g. Chemical Engineering
4. Enugu State Univ. of Science & Technology, Enugu	a. Agricultural Engineering b. Chemical Engineering c. Computer Engineering d. Mech./Prod. Engineering e. Civil Engineering
5. University of Agriculture, Makurdi	a. Civil Engineering b. Agricultural Engineering c. Elect/Electronics Engineering d. Mechanical Engineering
6. Ladoke Akintola University of Technology, Ogbomoso	a. Civil Engineering b. Chemical Engineering c. Computer Engineering d. Electrical Engineering e. Food Engineering f. Mechanical Engineering
7. Ambrose Alli University, Ekpoma	a. Civil Engineering b. Mechanical Engineering c. Elect/Electronics Engineering
8. University of Ado-Ekiti, Ado-Ekiti	a. Civil Engineering b. Mechanical Engineering c. Elect/Electronics Engineering
9. Nnamdi Azikiwe University, Awka	a. Mech/Prod. Engineering b. Civil Engineering c. Electrical Engineering d. Materials/Met Engineering

Continued >>

10. University of Uyo, Uyo	a. Chemical Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Agricultural Engineering e. Petroleum Engineering f. Mechanical Engineering g. Marine Engineering h. Food Engineering
11. Rivers State University of Science & Technology Port Harcourt.	a. Agricultural Engineering b. Chem/Pet. Engineering c. Civil Engineering d. Mechanical Engineering e. Electrical Engineering f. Marine Engineering g. Computer Engineering
12. Federal University of Technology, Yola	a. Agricultural Engineering b. Chemical Engineering c. Civil Engineering d. Elect/Electronics Engineering e. Mechanical Engineering
13. University of Maiduguri, Maiduguri	a. Agricultural Engineering b. Civil Engineering c. Electrical Engineering d. Mechanical Engineering
14. Obafemi Awolowo University, Ile-Ife	a. Agricultural Engineering b. Chemical Engineering c. Civil Engineering d. Computer Engineering e. Elect/Electronics Engineering f. Food Engineering g. Mechanical Engineering h. Met/Mat. Engineering
15. Federal University of Technology, Minna	a. Agricultural Engineering b. Chemical Engineering c. Civil Engineering d. Electrical/Computer Eng. e. Mechanical Engineering
16. Federal University of Technology, Owerri	a. Agricultural Engineering b. Chemical Engineering c. Civil Engineering d. Elect/Electronics Engineering e. Mechanical Engineering f. Met./Materials Engineering g. Petroleum Engineering h. Polymer/Textile Engineering
17. University of Ibadan, Ibadan	a. Agricultural Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Industrial/Prod. Engineering e. Mechanical Engineering f. Petroleum Engineering g. Wood Production Engineering
18. University of Ilorin, Ilorin	a. Agricultural Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Mechanical Engineering
19. University of Nigeria, Nsukka, Nsukka.	a. Agricultural Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Mechanical Engineering e. Electronics Engineering
20. University of Port Harcourt, Port Harcourt	a. Chemical Engineering b. Civil Engineering c. Elect/Electronics d. Mechanical Engineering e. Petroleum Engineering
21. University of Lagos, Akoka, Lagos.	a. Chemical Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Elect/Computer Engineering e. Mechanical Engineering
22. University of Benin, Benin City	a. Chemical Engineering b. Civil Engineering c. Elect/Electronics Engineering d. Mechanical Engineering e. Petroleum Engineering f. Production Engineering
23. Abubakar Tafawa Balewa, University, Bauchi	a. Civil Engineering b. Agricultural Engineering c. Chemical Engineering d. Elect/Electronics Engineering e. Petroleum Engineering f. Mechanical Engineering
24. Bayero University, Kano.	a. Civil Engineering b. Elect/Electronics Engineering c. Mechanical Engineering
25. Nigerian Defence Academy, Kaduna	a. Civil Engineering b. Electrical Engineering c. Mechanical Engineering
26. Anambra State University, Uli	a. Chemical Engineering b. Civil Engineering c. Electrical Engineering d. Mechanical Engineering
27. Covenant University, Ota	a. Chemical Engineering b. Civil Engineering c. Computer Engineering d. Elect/Electronics Engineering e. Information Communication Engineering f. Mechanical Engineering g. Petroleum Engineering
28. University of Agriculture, Abeokuta	a. Agricultural Engineering b. Civil Engineering c. Electrical Engineering d. Mechanical Engineering

Table 6 List of Council Members 1971 - 2009

Key: P President; VP Vice President; HS Honorary Secretary; HT Honorary Treasurer; PP Past President; ADEOLA Council Officer; DD Deceased

		71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
1	F A O PHILLIPS	P	P	P	P	P	P	P	P	P	P	P	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	DD	
2	OBI OBEMBE	X	X	X	X	X	X	X	X	X	X	X	P	P	P	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	DD								
3	A A ADEJUMO	X	X	X	X	X	X	X	X	X	HS	HS	HS	X	X	P	P	P	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP
4	V O OYEFODUNRIN	HS	HS	HS	HS	HS	HS	HS	HS	HS	X	X	X	X	X	X	X	X	X	X	X	P	P	P	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	DD		
5	T OA BAMGBOPA	HT	HT	HT	HT	HT	HT	HT	HT	HT	HT	HT	X	X	X	X	X	X	X	X	X	X	X	X	X	X														
6	OKONKWO	X	X	X	X	X	X	X	X	X																														
7	OMISORE	X	X	X	X	X	X	X	X	X																														
8	FAJEMIROKUN	X	X	X	X	X	X	X	X	X																														
9	J O SONUGA									X	X	X	X	X		X	X	X	P	P	P	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	DD							
10	J I FOLAYAN										X	X	X	HS	HS	X	X	X	X	X	X	X	VP	VP	P	P	P	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP	PP
11	MRS J O MADUKA										X	X	HT	HT	X																										
12	A A SONGONUGA										X				X								X		X				X											
13	O DOHERTY										X				X	HS	HS												X											
14	M O ADESINA										X				X										X			X	X	X	P	P	PP	PP	PP	PP	PP	PP	PP	PP
15	D O UHIMWEN										X				X										X															
16	I I NWANKWOR										X																													
17	I O OGUNTOYE										X																													
32	O ADEMOSU														HT	HT										X			X	X	X	X								
25	M O AKINTOBI														X	X	HT	HT																						
18	S O ODARO										X																													
19	M O OKORO										X														X															
37	C C AGBIM																						X		X			VP	VP	VP	X	X								
20	I A A OKUNOREN										X				X										VP	VP	VP	P	P	P	PP	PP	PP	PP	DD					
21	E J AMANA														X				HT	HT	HT												X	P	P	PP	PP	PP	PP	PP
22	T M ALUKO														X																									
23	S O ADENUBI														X																									
24	E O OGUNDIYA														X																									
26	H S SAMAILA														X										X															
27	A AJIDAHUN														X																									
28	R A ADU														X								X		X															
29	E D OSIBODU														X																									
30	B O NGWUOCHA														X																									
31	C OKWUONU														X																									
33	LANRE SAGAYA														X														X	X	VP	VP	P	P	PP	PP	PP	PP	PP	PP
34	A O SOYANWO																						X																	
35	LANRE OYENEKAN																	HS	HS	HS	HS		X		X															
36	S A ADIGUN																						X		X															
38	MAYEN ADETIBA																								X							VP	VP	X		P	P	PP	PP
39	E A BABANIJI																					HT	HT	HT	HT	HT	HT		X	X	X	X								
40	E C OKEKE																						X		X															
41	E B U UNUIGBE																						X		X							X	X	X	X					
51	E G SOGUNRO																											HT	HT	HT	HT	HT	X							
42	RALPH EKE																				X	HS	X		X															
43	DEBO ADEOYE																					X	HS	HS	HS	HS	X	X	X		DD									
44	I S OGUNBAYO																						X	X	X	X	HS	HS	X	X	X	X		X	X	VP			X	
45	A A FOWORA																								X															
46	D S OMALE																						X		X															
47	C O ADEGBOLA																									X				X	X	X	X						
48	A TOKUN																									X														
49	A B PINHEINRO																									X														
40	K A ADEOLA																										X	X	HS	HS	HS	X	X		X	X	X	X	P	P
52	R O SHODERU																												X	X	X	VP	X		X	X	X			
53	O FADAYOMI																												X	X	X	HS	HS							
54	E A I GEORGE																														X	X	X	X						
55	S ADAMU																														X	X	X	X			X	X	X	X
56	BOLA OLOWE																															X	X	X	X		X	X	X	
57	I O DIYOKE																															X	X							
58	OGUNNOWO-BOLAJI																																X	HT	HT	HT				
59	O A AJIBOLA																																X	X	X	X			X	X
60	M BULAMA																																X	X	X					
61	N RAFINDADI																																X	X	X	X				VP
62	O LAWSON																																	HS	HS	X				
63	K A ALI																																	X	X	X				
64	P I ABIYOU																																	X	X					
65	I A C DANGANA																																		X	X	X			
66	T KEHINDE																																		X	X	VP	VP	X	
67	JOHN OKODI-IYAH																																		X					X
68	A A AKINDIJI																																		HS	HS	HS	HS		
69	A O OYEKAN																																			X	HT	HT		
70	O ALLI																																			X				
71	A O OFUYA																																				X	X	X	
72	TAWA WILLIAMS																																				X	X	X	
73	DAPO ABE																																				X	X	X	X
74	K UMAR																																				X	X	VP	X
75	R EPHRAIM																																				X	X	X	
76	N NKPOSONG																																				X	X	X	
77	B OGUNDE																																					X	HT	HT
78	O MBOSOH																																					X	X	X
79	S K ILUGBEKHAI																																						X	X
80	E UJEGE																																						X	X
81	TUNDE OLOKO																																							X
82	FEMI EBOFIN																																							X
83	EMEKA SIBEUDU																																							X
84	O DARAMOLA																																							X
85	AJIBADE OKE																																							HS
		71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09

Table 7 Admin & Executive Secretaries

	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
ADMINISTRATIVE SECRETARIES																																							
Mr BANKOLE																																							
Mr OYEFOLU																																							
DAYO OYENEKAN																	X	X	X	X																			
Ms ODUNJO																					X	X																	
KOLA IDOWU																							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXECUTIVE SECRETARIES																																							
I A OLOMOLAIYE																																			X	X			
AJIBADE OKE																																					X	X	
BABATUNDE AMODE																																							X


a


b


c


d

CHAPTER 9

FIRMS, MEMBERS & PROJECTS

Images a - i: Key Players in ACENICO
a. EA Oyetoyan, Foundation staff and CEO 1989 – 2002
b. FAO Phillips, Permanent Board Member and Board Chairman 2006-2007
c. Tunde Oshadiya, Managing Director 2002–2007
d. JO Maduka, Board Member 2002-2007
e. JO Sonuga, Foundation Board Chairman 1998 – 2001
f. MO Adesina, ACEN Representative on the Board, 2001 – 2007
g. Yemi Songonuga, Initiator and Driver at formation
h. Obi Obembe, Permanent Board Member till 2002
i. SO Fadahunsi, Permanent Board Member and Chairmen of Company 2002-2006

Image above – Major high rise buildings on Lagos landscape mostly designed by ACEN member firms. by Bayo Adeola

The last five chapters reviewed the activities of ACEN as an association. ACEN was, however, only a representation of individual members and their firms. These members, mostly through their firms, carry out projects which are the essence of the consulting engineering industry. This chapter presents some of the individual members, their firms and their projects.

From a few individual members representing even fewer firms in the early 70's, ACEN individual membership rose to about 200 in 1980, dipped significantly in the eighties and nineties due to the political and economic environments described earlier, and only began to grow again in the late nineties. In 2007, the Annual General Meeting decided that the primary membership of the association shall thereafter be firms. In recognition of the services of many individuals who are now fairly old but want to continue to have relationship with ACEN, provisions were made for special individual membership. Today, ACEN has about two hundred member firms, most of which are small with about five staff each. A few firms, possibly around thirty, may be categorised as medium size with staff strength of between thirty and fifty. Firms with permanent staff of a hundred and more are unusual, but medium sized firms sometimes grow to this size when there are large projects.

Engineering covers a very wide field, and despite deep challenges, significant expertise has been acquired within and across specialities locally. Areas in which there is no reason to go outside the country for expertise include building structures, roads and highways, water resources development and waste water management in civil engineering. In electrical and mechanical engineering, it is safe to say that the local consultants have fully mastered building services design and rural and urban electrification. Reasonable experience still exists in ports and coastal engineering although it is fast dying out. Areas crying out for local expertise include power generation and rail transport in which there have been very little opportunity for acquisition of experience as a result of non-development of the sectors.

It is of course impossible to cover all the individuals and firms that have played important roles in ACEN and consulting engineering in Nigeria in a book of this size and apologies are offered to those who deserve to be mentioned but have been left out. The firms are presented in the order of their incorporation and only a few projects can be presented for each firm.

Obi Obembe & Associates 1958

The oldest local consulting firm, Obi Obembe and Associates, was established in Ibadan in 1958 by Engr. Obi Obembe, a civil and structural engineer. Engr Obembe played a leading role in the evolution of engineering practice in Nigeria and went on to be president of the Nigerian Society of Engineers and ACEN. He believed strongly that the Nigerian engineer had a strong role to play in the nation's development. He died in 2000 in Canada.

The firm specialised in Buildings, Highways, Bridges and Urban Planning. According to their brochure:

> *'A pioneering firm, patronage was low due to the lack of understanding by people in government and lack of city bye-law regulating development by the private sector. Ever since the bold thrust into the market with the available opportunity, however, the enterprise has been a great success..... We have been able to build a formidable team of engineers who in turn have exchanged ideas on projects involving foreign consultants whose expertise in their fields are recognised by various World Bank professional engineering bodies.*

The most prominent of their projects is perhaps the Structural Design of the 30-storey NECOM House (1970) for NITEL in Lagos, the tallest building in Nigeria. Others include the Ibadan-Ilorin Road and the Lagos-Eti Osa-Epe Road. Engr Obembe's engineer son inherited the firm and now has the challenge of maintaining the standard.

Omisore Afolabi & Partners 1962

Engr.Iyiola Omisore still designs and drafts at 82. He was born in 1927 and attended Oduduwa College, Ile Ife. He went to England in 1953 and enrolled at Hammersmith School of Building and obtained his MIStructE in 1959. He worked with Edward Wood & Partners and Andrew Kent & Stone before returning to Nigeria in 1959. On his return, he joined the Western Region Ministry of Works as the first structural engineer. He did not stay long at the Ministry as he was attracted into private practice by Design Group, an architectural firm. At the time, the practice was to award consultancy assignments in buildings as one lot. Omisore started working for Design Group on a part time basis until he was given an offer he could not refuse. A £2,400 salary per month, housing and car allowance, and a bonus of either 5% of the company turnover or 30% of the structural fees was too good to be true. Within a year,

he was able to buy a 'Mercedes Benz 180 Petrol'. This was, however not to last. The engineers had been clamouring for the separation of consultants' appointment on building and had worn the battle. Design Group was instructed to limit their assignment on the project he was on to architecture only. With the basis of the structural department in the firm undermined, he resigned to form his own firm, Iyi Omisore & Associates in 1962.

With the opportunities created by the new regulation, the firm grew and he needed support. He reached out to a colleague of his in Hammersmith who was still in England. Engr. Afolabi returned to Nigeria to join the firm which became Omisore Afolabi & Partners. Major projects carried out by the firm include the Nigerian Institute of International Affairs, the 22-storey National Bank Headquarters on Broad Street, the 20-storey Nigerian Insurance Building, Lagos University Staff Housing and several others.

Unfortunately, his partner died in 1979 and the firm reverted to the present name of Iyi Omisore and Partners. Engr. Omisore's first son is an architect, but his last son is an engineer and in the practice with him. The future remains bright.

Agbim & Partners 1965

The third oldest firm in our records is Agbim and Partners, founded in 1965 by Dr. Charles Chuba Agbim. Born in October 1934, Dr. Agbim had his secondary education at the Dennis Memorial Grammar School, Onitsha and his Cambridge certificate from the University College, Ibadan. He obtained his bachelor's degree in civil engineering from the University of Aberdeen in Scotland. He then proceeded to the Imperial College, London where he obtained the Diploma of Imperial College and his doctorate degree. He returned to Nigeria in 1963 and lectured briefly at the University of Lagos. He resigned in 1965 to found Agbim & Partners, a civil and structural engineering consulting firm. He is now retired and lives in Enugu. Engr. Agbim was a member of ACEN right from its formation and was its vice president in 1998. His engineer son, Nnamdi, has opted for the more lucrative contracting end of the industry and it is not clear what would become of the firm.

Major projects carried out by Agbim & Partners include the University of Lagos Water Sphere, the 15-storey Federal Palace Hotel & Suites (1974), 256 Kilometres Enugu-Port Harcourt Expressway Feasibility Studies (1975), 14-Storey Office Block for the Nigerian Mortgage Bank (1983), 'Ojukwu Bunker' and Ikoyi Hotel Extension for NNPC among others.

Adejumo & Partners 1966/ Adejumo Ogunsola and Partners (1970)

Adejumo & Partners was founded in 1966 by Engr. Dr. Adenrele Adejumo, a founding member of the Association of Consulting Engineers Nigeria and a signatory to the original Articles and Memorandum of association. As earlier discussed, he played a very active role in ACEN and was its third president. In 1970, he joined with Engr Olusola Ogunsola to form the firm of Adejumo Ogunsola and Partners.

Engr. Ogunsola was born in Sagamu and had his primary education there. He attended Baptist Academy, Broad Street, Lagos from 1949 to 1954 and left for the United Kingdom in 1957 where he attended the Willesden College of Arts and Technology from 1957 to 1962. On his return to Nigeria, he worked for the Federal Ministry of Works from 1962 to 1970. While still with the ministry, he ran a consulting firm, Second Consultants in partnership with Mr. Ogunbekun. He resigned from government employment in 1970 to co-found Adejumo Ogunsola and Partners. The partnership was dissolved in December 1981 after which he founded O. Ogunsola and Partners.

Major projects carried out by Adejumo Ogunsola and Partners include the Naval Dockyard, Wilmont Point, Victoria Island, Lagos, the Stock Exchange Building and the Lower Usman Dam in Abuja. Both engineers are now retired from consulting engineering practice.

Chris Fajemirokun & Associates 1967

The dominance of civil/structural engineering resulted in six of the eight oldest firms being in this field. The fifth oldest and the oldest services engineering firm was Chris Fajemirokun & Associates, founded in 1967. Its founder, Engr. Chris Fajemirokun was a founding member of ACEN and one of the signatories to the original articles and memorandum of association. The firm was a multi-disciplinary firm of consultants engaged in electrical, mechanical and fire protection engineering services. According to their brochure, the firm had:

> *Particularly pioneered research efforts in effective fire detection, fighting and evacuation system; solely organised a 3-day international seminar on Solution to Problems of Fire Fighting in High Rise Building at the Federal Palace Hotel in September 1987.*

Their major electrical projects include the Stallion Plaza, Marina for Union Bank PLC (1994), Nigerian International Merchant Bank Head Office in Victoria Island (1994), and the Ahmadu University Teaching Hospital (1990).

Civ-Struct Associates 1968

Civ-Struct Associates was formed as a partnership of two very active and committed members of ACEN, Engr. Titus Olagoke Bamgbopa, a signatory to the original articles and memorandum of the association and already presented in chapter 4, and Engr. Sikiru Olatunbosun Oke. On return to Nigeria from the United Kingdom, Engr. Bamgbopa worked for a few years with Obi Obembe and Partners before founding the firm.

Engr Bosun Oke was born on the 14th of March 1938 and attended Ijebu-Ode Grammar School from 1956 to 1960. On graduation, he proceeded to Hammersmith College, London, to study structural engineering where he met a senior colleague who was to be his partner later in life, Engr. Goke Bamgbopa. He obtained his Diploma in Structural Engineering from Hammersmith in 1964, and became a member of the British Institution of Structural Engineers in July 1967. On his return to Nigeria, he joined Bamgbopa to form Civ-Struct Associates in 1968.

Civ-Struct Associates went on to become a very successful firm with many prominent projects. One of their early breaks was the structural design of Dodan Barracks, the office and residence of the then head of state, Lt. Col. Yakubu Gowon. Engr. Bamgbopa recalled how they got to be the consultants for Dodan Barracks in 1968:

> *I had met Fola Alade, the chief architect with the federal ministry of works through a friend, Yinka Santos (later of Olaniyan Omotoso Santos & Co). Lt Col Yakubu Gowon was living in the Ikeja cantonment as the head of state. This is about twenty kilometres from the federal secretariat in Lagos and this was clearly a security risk. There was a need to build a state house in Dodan Barracks, Lagos and the architecture had been done. Normally, at this time, the structural design would have gone to Ove Arup or a similar foreign consulting firm. Fola Alade took the risk to present Civ-Struct to Lt Col Gowon and we were consequently appointed.*

The firm went on to carry out other major projects all over the country including Ahmadu Bello University Teaching Hospital, Zaria (1973), 22-storey headquarters for Bank of the North (1978), the Federal Secretariat, Abuja (1988), Federal Secretariats in all the state capitals (1980), University of Jos Teaching Hospital, Nigerian Mission Building in New York (1993), CBN Headquarters in Abuja (1998) and several state headquarters and the National Assembly Complex (2004) among others.

Engr. Bamgbopa is now retired and Engr Oke continues to run the practice, though not at the pace that kept them ahead of the pack for a long time. Some of his children are engineers and there is still hope that the firm can bounce back.

Osot Associates 1968

Osot was formed in 1968 by three partners, Engrs Adeniyi Olufemi Olumide, Kayode Ayinde Segun and Adegbola Tokun. Engr. Olumide was born in 1937 and had his bachelor's degree from Ahmadu Bello University, Zaria. He had his work experience with the government of Western Region before resigning to co-found Osot. His strength was in highway planning and construction supervision and he is the firm's partner in charge of highways and bridges. Engr. Tokun was born in 1939 and had his bachelor's degree from the UK. He worked for several years in the United Kingdom, mostly in the areas of water and waste water. On return to Nigeria, he worked with the Western Region government until the founding of Osot. He is the partner in charge of water and sewerage systems design. Dr. Segun obtained his doctorate degree from the Imperial College, London and worked briefly for Ove Arup & Partners, UK in 1967 before returning to Nigeria. He lectured at the University of Ibadan from 1967 to 1970 before becoming a partner with Osot.

Osot is a multi-disciplinary firm and is well known for highways, structures, water resources and waste water management projects. Their major projects include Abuja Transportation Studies & Transit Way Design (1989), Ibadan Sewage Treatment Plant/ Sewerage and Sewage Disposal Project (1982), Ona River Flood Control (1994), New Ilesha and Ejigbo Water Supply (1994) and Sepeteri Irrigation Scheme (1994).

Finco Engineers 1969

The last of the firms founded in the sixties is Finco Engineers, founded in 1969 by Engr. (Prof) V. A. Akinsete. He was joined by Engr. Dr. O. O. Ajayi and Engr. M. F. Ogedengbe as partners in 1973, and Engr. O. Adeyinka

as principal partner in 1976. Akinsete and Ajayi were better known as lecturers at the University of Lagos, which they did simultaneously with the running of their firm. Although the firm and its principals were members of ACEN, they were more active in the Nigerian Society of Engineers where they played leadership roles. Akinsete is a past technical secretary of NSE and past chairman of the Mechanical Division of the society. Dr. Ajayi went on to become the president of the society for 1995 and is currently the chairman of the board of trustees.

Finco was a multi-disciplinary firm specialising in electrical, mechanical, sanitary, air-conditioning, and industrial engineering. Some of the well known projects carried out by the firm include the Nicon-Noga Hilton, Abuja, NECCOM House Restoration, Lagos, Aluminium Smelter at Ikot Abassi, Single Superphosphate Factory at Kaduna and Sheet Glass Factory at Igbokoda.

Of the eight firms founded before the 1970, none is in a pre-eminent position today, and at least five of them are no longer in existence. The individual engineers have done very well and are well respected in the society. The battle of succession and continuity had been fought and lost.

F. A. O. Phillips & Associates 1970

Engr. F. A. O. Phillips retired as General Manager from the Railways in 1970 after 35 years of meritorious service starting from 1934. He then founded the firm of F. A. O. Phillips and Associates, which he ran for another 37 years until his death in January 2008. He has been succeeded in the firm by his son, Engr. Lanre Phillips.

Some of the projects by F. A. O. Phillips and Associates include the Preparation of Master Plans for the University of Lagos 1984, the University of Benin 1986 and the National Post Graduate Medical College 1990; Engineering Services for the 350-Room Sheraton Hotel & Towers, Lagos 1989, Design and Supervision of Mechanical and Electrical Services for Housing Estates for A. G. Leventis PLC 1992, UACN PLC 1991; and the Design and Supervision of Electrical Engineering Services for MUSON 1989.

UNECON Associates 1970

Unecon Associates was registered in 1969 but did not commence business until 1970. The firm started as a building services firm but has broadened out to include all aspects of mechanical, electrical, power, water resources engineering and computer applications services. It was formed by three senior engineers, Engrs. V. O. Oyefodunrin, A. O. Soyanwo and Dr. S. A. Akinleye.

Engr. Tunde Oyefodunrin was a pioneer member of ACEN and its first honorary secretary. He went on to serve as its president from 1991 to 1993. Engr. Soyanwo attended Igbobi College, Lagos and obtained his bachelor's degree from the Kumasi College of Science and Technology, Ghana.

Unecon has an impressive list of projects to their credit, including the design of mechanical services for the Lagos University Teaching Hospital (1988), University of Ibadan (1986) and Eko Hospital (1986); project management and supervision of Eko Le Meridian Hotel (1994), mechanical and electrical services for Leyland Assembly Plant in Ibadan (1989), International Merchant Bank Head Office (1990), and UBA Head Office (1990), among others.

A major achievement of Unecon is that it has managed succession successfully. The baton of leadership has been handed over from Oyefodunrin to Soyanwo and on to the present principal partner, Chris Olayiwola Adegbola. The current honorary treasurer of ACEN, Engr. Tunde Ogunde, is a partner in the firm.

Etteh Aro & Partners 1970

In highway design, perhaps the best known firm is Etteh Aro and Partners, established by two senior engineers, E. I. I. Etteh and Arokodare in 1970. Engr. Etteh was born in 1939 and had his secondary education at the Hope Waddel Institute, Calabar. He obtained his bachelor's degree in civil engineering from Ahmadu Bello Univeristy, Zaria in 1963. He later obtained master's degrees in both bridges and highways for the University of Surrey. He had his pupilage with Ove Arup and Partners in Ibadan in 1964 and rose to become a senior engineer by 1970. He resigned his appointment and with a colleague, Engr. Arokodare, established the firm of Etteh Aro and Partners.

Etteh Aro & Partners expanded rapidly and became very well known in the industry. They established branches in several states and empowered their associates to run the branches. Even now (2009), they have six partners in six locations in the country. They also have a very positive staff training scheme, and have sponsored about fifty staff for post graduate

studies mostly in the United Kingdom. Major projects carried out by the firm include Onitsha-Enugu expressway (1977), National Stadium, Abuja and ten other stadiums in the country, Regional Road network for Abuja, UBA 20-storey head office in Lagos, Central Bank, Abuja, Unipetrol Head Office, Victoria Island and many more.

Enplan Group 1970

Enplan Group was at some point perhaps the largest consulting firm in Nigeria. Formed by very senior engineers including one of the signatory to ACEN Articles and Memorandum of Association, Engr Charles Okonkwo, a past president, Dr. J.O Sonuga and Engr. E. O. Williams, it was able to carry out large and complex projects such as the third axial road into Lagos (1987), Jibya Dam Irrigation and Water Supply Scheme (1990), Federal Ocean Terminal, Onne (1991), Enugu Sports Stadium (1979), Federal Trunk Road Study Phase 2 (1988) and Ministry of Defence, Abuja (1990).

Engr. Okonkwo died in 1979 and Dr. Sonuga ran the firm as principal partner till his own demise in 2003. The firm is now managed by Dr. Sonuga's son.

Leccom Associates 1970

Mrs Joanna Olutumbi Maduka had her secondary education at the Queen's School, Ede and her bachelor's degree in Applied Physics from the then University of Ife in 1965. In 1966, she passed the Institute of Electrical Engineering (IEE) London Graduating Examination. Subsequently, she obtained her master's degree in engineering from Trinity College, Dublin in 1969. She was assistant lecturer at Ife from 1966 to 1970 when she resigned to join Leccom Associates, a firm of electrical and mechanical engineering consultants, as a senior engineer and later became the principal partner.

Some of the projects carried out by Leccom Associates include the Obafemi Awolowo University Teaching Hospital Complex, State Hospital, Ibadan, Faculty of Health Sciences, OAU, Industrial Development Centre, Osogbo, Liberty Stadium Extension, Ibadan, and Nnamdi Azikiwe Sports Complex, Enugu.

What distinguishes Mrs. Maduka from the pack is that she is the trail blazer for women engineers in Nigeria while remaining a core professional. She was ACEN's honorary treasurer from 1982 to 83, founding president of the Association of Professional Women Engineers of Nigeria, APWEN, and vice president and member of council of the Nigerian Society of Engineers at different times. Married with children she still runs her firm.

Kabeaco Associates Ltd. 1970

Engr Ekundayo Adetunji Babaniji was born in 1940, had his secondary education at King's College, Lagos and obtained his bachelor's degree in electrical engineering from Ahmadu Bello University, Zaria. He worked with Mandilas Limited in Lagos and Carrier International, Syracuse and Nigerian Institute of Management before establishing his own company, Kabeaco Associates Limited in 1970. Kabeaco's notable projects include the renovation of the 20 storey Cocoa House in Ibadan (1988) and the refurbishment of the air conditioning in Freeman House, Lagos (1990).

Comprehensive Engineering Consultants 1971

Engr.Fadahunsi was born in 1920 and had his secondary education at Government College, Ibadan. He obtained his Diploma in Civil Engineering from Higher College, Yaba in 1946 before proceeding to the University of London where he obtained his B.Sc. degree in 1951. He worked in England till 1954 when he returned to Nigeria and worked with the Western Region Government. He transferred to Lagos where he worked from 1963 to 1971 when he retired to found the firm of Comprehensive Engineering Consultants in partnership with Engr. J. O. Ibironke.

Major projects carried out by CEC include the 15-storey Lafia Hotel Building in Ibadan, Jos/Gbuguru and Gboko/Yandev Water Supply Schemes, and Water Supply to Abeokuta and Environs.

Engr. S. O. Fadahunsi was a man who dedicated most of his life to the service of the engineering profession. He played major roles in the formation and growth of the Nigerian Society of Engineers and was at different times its deputy president and president. He was also the president of COREN from 1977 to 1986. Although he was better identified with NSE, he also served ACEN, especially at the formation of ACEN Insurance Company and throughout its life.

Progress Engineers 1971

Progress Engineers was established in 1971 by Engr. Dr. J. I. Folayan. Best known as a geotechnical firm, they also carry out civil and structural designs, highways and irrigation designs and supervision. Joseph Folayan is well known for his commitment to ACEN and has been honorary treasurer, honorary secretary, vice president and president at different times. He is the only person on record to have held all executive posts of the association. He was also very active in FIDIC and served on the executive committee from 1988 to 1992, the first of such from Africa. He was chairman of GAMA from 1996 to 1997. He tenure as ACEN president ended in 1997, but he has remained active and committed to the association and attends all scheduled meetings. A major achievement of Joe Folayan is that he attended twenty successive FIDIC annual conferences.

Major projects carried out by Progress Engineers include the Feasibility Study and Engineering of Phase 111 of Kampe River Irrigation Agricultural Development Project (1984), Detailed Engineering Design of Sasa Irrigation Project (1984), Improvement of Hydrological Stations within the Sokoto-Rima Basin (1980), Offshore Soils & Foundation Investigations for several oil companies, Geotechnical Investigation of Ajaokuta Steel Complex (1981), Soil and Foundation Engineering for Second Refinery Project (1977), and numerous others.

Amana Consulting Engineers 1971

Amana Consulting Engineers was founded by Engr. Edet J. Amana, a past president of ACEN and current vice president of the Academy of Engineering. His profile has earlier been presented as ACEN President from 2004 to 2005.

Amana Consulting Engineers flagship projects include the 21-storey Lagos State Police Headquarters (1978), Akwa Ibom State Secretariat Complex at Uyo (1989), the Oku Iboku Paper Factory (1990) and the Abuja Transitways for FCT (1988).

Adeyemi Ogundipe & Partners 1972/AOP-Consult Limited/ Konsadem 1984

Adeyemi Ogundipe & Partners was founded in 1972 by Engrs Benjamin Omotunde Adeyemi and Emmanuel Oluseye Ogundipe. They were joined as partners by Israel Olufela Oluyemi and Randolph Ademola Adu in 1975. In 1984, the firm split into two, AOP-Consult Limited in Lagos with Ogundipe, Adu and Adeola as partners, and Konsadem Associates in Ibadan with Engr. Adeyemi as the principal partner.

Major projects carried out by Adeyemi Ogundipe & Partners include the 16-storey Elephant House Building for Shonny Investment (1982), Water Supply to Abuja (in association with C. Lotti & Associati of Italy and Oluonye & Partners of Benin) (1979), Lagos Mainland Sewage Study (in association with Gilbert Associates of the USA) (1978) and Management of Septic Tank Sludge and Liquor for Lagos Metropolis (1987). Highway projects include the 107 kilometre Nassarawa-Lafia Road (1976) and 150 kilometre Tegina-Zungeru-Izom Road (1980).

Emmanuel Oluseye Ogundipe had his secondary school at King's College, Lagos and his bachelor's degree in civil engineering from Ahmadu Bello University, Zaria. Upon graduation in 1964, he worked at Ove Arup and Partners before resigning to found Adeyemi Ogundipe and Partners in 1972.

Ademola Adu was active in ACEN in the eighties and was for several years a member of the Technical Committee. He had his secondary school at King's college, Lagos. He obtained his bachelor's degree from Harvard University and his doctorate from the California Institute of Technology. On his return to Nigeria, he worked briefly with Shell-BP Petroleum before joining the firm of Adeyemi Ogundipe & Partners.

Engr. B. O. Adeyemi graduated in civil engineering from the University of Aberdeen, Scotland and obtained a Post Graduate Diploma in Sanitary Engineering from Chapel Hill, USA. He worked for several years with the Western Region government before founding Adeyemi Ogundipe & Partners in 1972. After the transition to Konsadem, he employed a young engineer, Bola Olowe, in 1986. Olowe rose to the position of a director in the company in 1994. Major projects carried out by Konsadem include the Middle Ogun Irrigation Project (1996), Ibadan Solid Waste Management Project (1996), Water Rehabilitation Zone B Project, Kaduna (1992), Bida – Keffi – Akwanga Road, Igboora-Igangan Road in addition to the Adeyemi Ogundipe & Partners projects.

Bola Olowe graduated from the University of London with a bachelor's and a master's degree in 1986. He has been very active in ACEN and was on the Council for several years as well as chairman of different committees.

Sshwed Associates 1972
Although Sshwed was registered by Engr. Michael Olusegun Adesina in 1970, it did not commence business until 1972. He was joined by the second principal partner, Engr. O. O. Osinowo in 1973. A past president of ACEN, Otunba Adesina as he was fondly called, was a very active member for several years and represented ACEN on ACEN Insurance Company board for several years. He has since transitioned from Otunba to Kabiyesi, the paramount ruler of Owu-Ijebu.

Sshwed is a multi-disciplinary firm of civil and structural engineering with services in water resources development, highways, bridges and building structures. Some of their projects include the Monitoring and Management of Hydrometric Stations, Wells and Boreholes in Upper Benue River Area (1985), Underground Water Resources Study for Metropolitan Lagos (1982), National Water Rehabilitation Programme (1995/96) and Maiduguri-Gamboru Road.

Morgan Omonitan & Associates 1972/ Morgan Omonitan & Abe (1991)
Morgan Omonitan & Abe was another prolific structural engineering practice. Originally formed in 1972 as Morgan Omonitan & Associates, it became Morgan Omonitan & Abe in 1991 when it absorbed Engr. Dapo Abe as a partner.

The present managing director, Dapo Abe, attended Government College, Ibadan and obtained his civil engineering degree from the University of Lagos. Major projects carried out by the firm include the Mobil Headquarters in Victoria Island (1992), the Headquarters of Intercontinental Merchant Bank in Victoria Island (1991), 16-storey office block for Yinka Folawiyo & Sons in Apapa (1990), Glass Factory at Ughelli for Delta Glass (1994), Cigarette Factory Plant for Rothmans in Kaduna (1992), and several housing estates and offices for Central Bank of Nigeria, Coca-Cola Bottling Company and others.

Vasons Concept 1973
Vasons Concept is another firm that has successfully managed succession from the founders to the present owners and managers. It was founded by two partners in 1973. The first partner, Engr. Adeyemi Songonuga became full time in 1974 while the second partner, Engr. R. Omokayode Soderu became full time in 1976. The third partner, Engr. Victor Olusegun Oyenuga, joined the partnership in 1991. Engr. Yemi Songonuga is best known in ACEN for his role in the formation of ACEN Insurance Company and his passion in supporting the company throughout its life. He also served as chairman of committees at different times.

Engr. Soderu served ACEN as chairman of several committees and vice president from 2002 to 2003 and was on ACENICO board for a few years. He was born in 1939 and obtained his bachelor's degree in engineering from the University of Aberdeen. On graduation, he worked with a consulting engineering firm in Scotland. On his return to Nigeria, he worked briefly with the Nigerian Railways before joining BP (Nig.) Limited from where he resigned to work full time with Vasons Concept.

Engr. Segun Oyenuga actively supports ACEN's activities and has served on several committees at different times. He is, however, best known among engineers in his role as a key member of the Nigerian Institution of Structural Engineers and for the several books he has published. He joined Vasons Concept as a technical officer and went on to obtain bachelor and master's degrees and the Diploma of Imperial College, DIC.

Both Engrs. Songonuga and Soderu have retired on reaching their mandatory retirement age of sixty five years and the firm is now run by Oyenuga.

Molad & Molad Associates 1973
Molad & Molad was founded in 1973 by two senior engineers, Engr. Sunday Adegboyega Adigun and Engr. D. K. Omodara. Engr. Adigun was born in 1938 and had his bachelor's degree from the University of Glasgow. He co-founded Molad & Molad 1n 1973. Some of the projects carried out by Molad and Molad include the Design of Birni Gwari-Anka Road 1984 and the Katsina Ala-Zaki Biam Road 1993 for the Federal Ministry of Works, 11-storey Office Complex for Guinea Insurance PLC 1989, Coastal Wall Defence around Lagos Environ for Trevi Foundation 1988, and Office Complex and Workshops for Lagos State Waste Management Board 1986.

Landscope 1975
Engr. Jimi Ashaye graduated in civil engineering from the University of Lagos in 1969 and obtained his masters in bridges from the University of Surrey in 1973. He formed Landscope in 1976 with Lanre Sagaya who later resigned from the partnership. He worked with Ove Arup and Partners both in Nigeria and abroad, and with Nigersol Construction Company Limited. Key projects include Aladja Steel Township Infrastructural Development (1987), NITE Head Office, Abuja (1995), Federal Court of Appeal, Abuja (1995) and Sheda Science Village (1994).

Elens Consult 1975
E. S. Eigbokhan graduated with B. Eng. in electrical engineering in 1973 and worked with the Broadcasting Organisation of Western Nigeria, and the Federal Ministry of Works as an electrical engineer.

Some of the projects by Elens Consult include Electrical and Mechanical Services for NDIC Building in Lagos 1992, Itakpe Water Supply Scheme for the Nigerian Iron Ore Mining Company 1984, 2.5 KVA Substation for NIFOR in Benin 1987, Upgrading of Electrical Networks for Nigerian Ports Authority 1982, and New Yard Development for Texaco 1992.

Intecon Partnership 1976
Engr Olumuyiwa Alade Ajibola graduated from the University of London in 1970 and obtained his master's degree in Highways from University of Birmingham in 1979. On his return to Nigeria, he worked with Etteh Aro and Partners. He resigned in 1976 to co-found Intecon Partnership.

Dr. Olatunbosun Adefolaju graduated from the University of Lagos in 1970 and obtained his doctorate degree from the University of Leeds in 1974. He worked with the firm of Adeyemi Ogundipe and Partners before resigning to co-found Intecon Partnership.

The firm has worked extensively in oil and gas and their major projects in this sector include Detailed Engineering Design of Buildings (1994), Rehabilitation of Jetty Road (1982), QIT-Ibeno Road (1990), Eket Air Strip Expansion (1992) and several others at the Qua Iboe Terminal in Eket for Mobil; Engineering Procurement and Construction of Airstrip at BRT, Bonny (1997), Detailed Engineering Design of Escravos Airstrip Upgrade (1999), and Geotechnical Investigation for West Africa Gas Pipeline Project at Badagry On-shore site (2002/03).

Founded as Intecon Partnership, it has now become Intercon Partners Ltd., a group of companies comprising Intecon (Engineering consultancy and group holding), Interworks Engineering (construction), Automated Geotechnics (Engineering and Geotechnics Survey) and Tecons Investment and Properties Limited.

Engr. Ajibola has been very active in engineering societies, especially the Nigerian Society of Engineers of which he is the present Deputy President, to assume the position of national president in January 2010. He has also served on the council of ACEN.

Samaila Consultants Limited/ Samaila Omale & Partners (1977)
Samaila Omale & Partners was founded in 1977 by two senior engineers, Habila Shehu Samaila and Omale. Engr. Samaila was born in 1945. He was a lecturer and head of civil engineering department at the Kaduna Polytechnic before resigning to join the firm of Ward, Ashcroft & Parkman from 1974 to 1976. He resigned to found the firm in 1977.

Major projects carried out by Samaila Consultants Limited include Inner Northern and Inner Southern Expressways for the City of Abuja, Infrastructural Services for Kaduna City Centre for Kaduna State Government, Monitoring and Managemetn of Hydrometric Stations, Wells and Springs and Boreholes in Kaduna, Gbako and Gurara Valley for Kaduna and Niger States, and several others.

Interplan 1977
Engr. (Major) E. B. U. Unuigbe was born in 1943 and had his bachelor's degree in electrical engineering from Ahmadu Bello University Zaria. He worked with the Electricity Corporation of Nigeria, ECN from 1966 to 1969 before joining the Nigerian Air Force. While in the force, he obtained a diploma in avionics from the Soviet Central Staff College, Frun Zie. He voluntarily retired from the air force in 1975 and founded Interplan Engineers. Major projects carried out by Interplan include Central Lagos Sewage Disposal System (1976), Adiyan Waterworks Stage 1 (317,000 m3/day) (1983), 65 Kilometres Primary Trunk Mains for Lagos (1983), Iju Waterworks Modernisation (205,000 m3/day) (1981), Mainland Drainage System Master Plan (1976), Primary Storm Channel Drainage (1978), Aircraft Maintenance Workshop for NAF (1981),

Akintobi Oyenekan & Partners 1977/ Lanre Oyenekan & Partners 1985

Lanre Oyenekan had his secondary education at the Baptist Boys' High School, Abeokuta and St. Gregory's College Lagos. He had his university education at the University of Technology, Munich, Germany where he obtained his bachelor's degree in 1966 and his master's degree in 1969. He obtained his Ph.D from Rurh University, the first African to achieve this in the university. On return to Nigeria, he founded the firm of Akintobi Oyenekan and Associates with his uncle in 1977. This was his introduction to ACEN. Engr. Akintobi was very active in NSE and ACEN. He resigned from the partnership in 1985 to establish his own firm, Lanre Oyenekan and Partners.

Adeoye Fowora & Partners 1979

In the area of hydraulics and harbour works, perhaps the best known firm was Adeoye Fowora and Partners. Adeoye Fowora was born in 1934 and had his secondary education at Ijebu-Ode Grammar School before proceeding to London where he graduated in civil engineering. He started his professional career in 1961 with the firm of E. J. Cook & Partners. He returned to Nigeria in 1963 and joined the Nigerian Ports Authority where he rose to the position of Assistant General Manager (Engineering Services and Estates). He resigned voluntarily in 1979 to found the firm of Adeoye Fowora & Partners.

The firm was best known for marine and harbour works and coastal engineering. Their major projects include the 250 ton Apapa Dockyard Slipway (1981), the Ship Repair Yard for Nigerdock at Snake Island Lagos and Port Harcourt (1984), Mooring Dolphins & Ancillary Facilities for the New Floating Dock at Apapa Dockyard (1993), Stabilisation studies for Victoria Beach, Lagos (1981), and Stabilisation and Coastal Erosion Studies at Egbin and Ikorodu Foreshores (1989). Others include the 15-storey office building for Star Finance (1993) and the Standard Flour Mills Factory Complex on Creek Road, Lagos (1983).

Gomel Engineering Limited 1979

Ralph Eke was the honorary secretary of ACEN in 1990. Born in 1949, he had his university education at the Ahmadu Bello University, Zaria and started his practice, Gomel Engineering Limited in 1979. Major projects by Gomel include Abuja Central Area infrastructures (1981), Abuja City Bridges and Viaducts (1982) and Inner Southern Expressway (1982).

AIM Consultant (1979)

Aim Consultant was founded by Engr A. I. Moussali in 1979. Engr. Mousalli graduated with a bachelor's degree in mechanical engineering in 1975 and went on to obtain master's degrees in mechanical engineering in 1976 and civil engineering in 1977, making him both a mechanical and a civil engineer. Some of the projects carried out by Aim Consultant include the Final Engineering Design Phase 2 of Abuja 1988, Lagos Island Storm Water Drainage 1993, Abuja National Mosque Support Complex 1987, and Ecowas Secretariat and Conference Centre, Abuja 1989.

Yolas Consultants 1980

Engr. Yusuf Olanrewaju Sagaya has been a committed member of ACEN for several years and was its president from 2002 to 2003. He had worked in several firms including Ove Arup and Partners and Osot before founding Landscope with his colleague and friend in 1976. He resigned from Landscope in 1980 to found Yolas Consultants.

Yolas presently has three offices in Lagos, Abuja and Ilorin, with Ilorin as the head office. The company works in broad areas of civil engineering including highways, building structures and water resources. Their major projects include the National Aircraft Maintenance Centre, Abuja (1981), Jega-Gumi Road (1991), Maitama District Infrastructures, Abuja (1980), Swashi Dam and Irrigation Works (1989), several hospitals and buildings.

Mecholect Engineering 1980

Engr. E. C. Sogunro was ACEN treasurer for several years. Born in 1941, he graduated with a bachelor's degree in mechanical engineering from the University of Lagos in 1969. After working in government and the private sector for several years, he founded Mecholect in 1980.

Some of the projects carried out by Mecholect include Design of Electrical and Mechanical Services for Lennards Nigeria Limited, Kano 1984, Federal Mortgage Office Block, Jos 1986 and Afribank 94 Broad Street Refurbishment 1988; Hospital projects include the National Blood Transfusion Building, Abuja 1982 and Ogun State University School of Pharmacy 1991.

Engroaconsult 1980

Engroaconsult, a division of Engro Group Nigeria Limited, was founded by Engr. Olasupo Ademosu in 1980 and later joined as partner by Engr.

Olawale Akinpelu. Engr. Ademosu graduated with bachelor and master's degrees in civil engineering. He also has a bachelor's degree in law and was called to the Nigerian bar.

Some of the projects carried out by Engroaconsult include Erosion Control Works for several towns and villages in Delta and Edo States 1988, Design of Engineering Infrastructures of Kado and Gwarinpa 1 District of Abuja 1999, and Engineering Design Content of the Rehabilitation/ Construction of Maiduguri-Monguno-Cross Kauwa-Baga-Cross Kauwa-Kukawa-Damasaki Road, Borno State 1999.

Kay-Dek Associates 1981

Engr. Kayode Adekoya is the principal partner of Kay-Dek Associates, a firm he founded in 1981. Born in 1944, he had graduated in electrical engineering and had his pupilage at the P & T in 1969 but left to join B. M., a computer company in 1970 where he worked for seven years. In 1977, he joined an expatriate consulting firm, Gregory Stathopoulos and Partners and resigned in 1981 to found his own firm. His major projects include Nigerian Population Commission Zonal Computer Centres (1990), Guinness Nigeria Plc Head Office Building (1992) and Security and Exchange Commissions Headquarters in Lagos (1993).

F. A. Oseni Consultancy Services 1981

Engr. Festus Alfred Oladimeji Oseni was born in 1934 and had his secondary education at Government College, Ibadan from 1949 to 1954. He graduated in civil engineering from Queens University of Belfast in 1960 and obtained masters degrees in civil engineering and Public Works from the University of Pittsburgh in the United States. He had his earlier career in consulting engineering firms in the UK before joining Crown Agents form 1961 to 1963. He returned to Nigeria and joined the Federal Ministry of Works. He then went for a post graduate course in Public Works Management at the University of Pittsburgh, USA. He returned to Nigeria in 1973 and worked with the Highways Division of the Federal Ministry of Works till 1978. In April 1978, he transferred to the Federal Capital Development Authority. He retired voluntarily in 1981 and founded F. A. Oseni Consultancy Services. Some of their major projects include final engineering design of Jaga-Daikin Takwas Road, Sokoto (1982) and Ogbomoso-Osogbo-Ilesa Road (1986).

Engr. Oseni made significant contributions to the writing of this book.

Landmark Integrated Technologies Limited 1982

Landmark was founded in 1982 by two engineers, Oreoluwa Fadayomi and Oluyomi Lawson. Both engineers graduated in civil engineering from the University of Lagos in 1974. Ore Fadayomi worked at the Kano State Ministry of Works, E. O. O. Fasehun & Associates, Leecon Associates, Vasons Concept and Oscar Faber Nigeria before the founding of Landmark. Yomi Lawson worked at the River State Utilities Board, Port Harcourt, Nigerian Steel Development Authority and Adeyemi Ogundipe and Partners. He obtained his master's degree in Construction Management from the University of Lagos in 1989. Both Fadayomi and Lawson are past secretaries of ACEN.

Major projects carried out by Landmark include the 14-storey Pearl Stone Centre in Lagos, 22-storey Head Office for Afribank in Lagos (1996), 7-storey Head Office for Chatered Bank Limited (1995) and 800 Housing Units at Kuje in Abuja among others.

McAdog & Associates1983

Lekan Ogunbayo was born in 1943 and had his post-secondary education at Ibadan Technical College, Yaba College of Technology and finally, University of Lagos where he obtained his bachelor's degree in electrical engineering. He worked with Afro Electro Konsult and Edison Group and Partners for several years.

Debo Adeoye was the honorary secretary of ACEN from 1992 to 1995. Born in 1947, he had his post secondary education at Yaba College of Technology and the University of Lagos where he obtained his bachelor's degree in mechanical engineering. He went on to obtain a postgraduate diploma of Oil and Gas Consultants International, Tulsa, Oklahoma in petroleum engineering. He worked for several years with Agip Oil Company and Edison Group and Partners.

Their firm, McAdog & Associates was established in 1983 after over ten years as associate partners with Edison. Major projects include the 33KV power supply to Nigerdock at Snake Island (1991), Security Printing and Minting Factory Complex (1993), Joint Aviation Fuelling Facilities at Mallam Aminu Kano Airport, Kano (1986), Sheda Science and Technology Complex, Sheda (1990).

Sani-Mustapha & Associates 1983

Sani-Mustapha & Associates was founded in 1983 by Engr. Mustapha

Bulama as a civil and structural engineering firm and has grown to become a multi-disciplinary firm including electrical and mechanical engineering in its scope.

Engr. Bulama had his secondary education at Government College, Keffi and his first degree in civil engineering from the Ahmadu Bello University, Zaria in 1977. He had his youth service at the Ministry of Works, Benin City from 1977 to 1978, after which he worked with Etteh Aro and Partners from 1978 to 1982. He had his master's degree from Imperial College London in 1982. He has been very active in engineering associations and was the president of the Nigerian Society of Engineers from 2004 to 2005.

Major projects carried out by Sani-Mustapha & Associates include Structural Design for the National Hospital Abuja (1996), PTF Rehabilitation of Tertiary Health Institutions for Zone IV (1996), Nigerian Labour Congress / NSITF Ten-Storey office block Abuja (1994), Unity Bank Ten-Storey Headquarters Abuja (2002), Bridge Structures for Jahi and Kafe Districts in Abuja (2003-2007) and the Design of 600 Km Kano-Maiduguri dualisation now under construction.

PSE Consultants Limited 1984

PSE was established in 1984 as Prime Services Engineers. In 1993, it became a limited liability multi-disciplinary firm covering engineering, architecture and quantity surveying services. The chairman and managing director is Engr. M. I. Ufoeze. Major projects carried out by the firm include Owena Multi Purpose Dam, Suleija Water Supply (1992), Diamond Bank Head Quarters, Lagos, Benin-Warri Road and PTF National Rural Water Supply.

Delkem Associates 1984

Delkem Associates was founded in 1984 by past president Mayen Modupeola Adetiba, already presented as the first female president of ACEN. An active player in engineering associations including APWEN, NSE and ACEN, she is the current president of GAMA.

Major Projects carried out by Delkem are the Structural Design of the former Texaco Overseas Oil Company yard , Warri, the Dualisation of Uyo-Ekom-Iman-Abak Road now Olusegun Obasanjo Road, Akwa-Ibom State Secretariat Phase II, Ibeno Shore Protection and the permanent site of the University of Uyo Library,.

KOA Limited 1985

Kunle Ogunbayo and Associates was formed in 1985 by a past secretary of ACEN, Kunle Ogunbayo. Born in 1952, he attended International School, Ibandan and got his bachelor's degree from the University of Lagos in 1973. He started his professional career with the Western Nigeria Broadcasting Corporation before joining Faber & Partners. He became a partner of Biobaku Faber and Partners from where he resigned to form his own firm.

Major projects carried out by KOA include Folawiyo Plaza in Apapa (1994), AP Plaza in Abuja (1992), Abuja Phase 11 infrastructures (1995).

Gomet Associates Limited 1986

Ogunnowo-Bolaji got his bachelor's degree from the University of Ife in 1970 and his master's degree from King's College, London in 1973. He went on to obtain an M. Phil from the University of Sussex in 1978. He founded Gomet Associates in 1986. Major projects include Independent Power Supply for Nigerian Ports Authority (2005-2009), Renovation of CBN Learning Centre (2007-2009) and Office Development for West African Examination Council, Abuja 1996-2000.

CA Consultants 1987

CA Consultants Limited is a foremost electrical and mechanical engineering services company founded in 1987 by Charles Yele Akindayomi. The other directors of the company are Engr Wole Alli and Olaniyi Kehinde. Charles Akindayomi had his bachelor's degree from the University of Surrey in England and worked with Oscar Faber and Partners before forming his own company in 1987.

CA Consultants has carried out numerous projects including the Palms Shopping Mall, Canadian High Commission, Muson Centre, Chevron Recreation Centre and several housing and office complexes.

Integrated Engineering Associates 1987

This Kaduna-based consulting firm was founded by three engineers, Suleiman Adamu, Hassan Kuliya Umar and Muhammad Nura Khalil. They were all course mates graduating in civil engineering from the Ahamdu Bello University, Zaria in 1984. They were joined in 1992 by Aliyu Aziz, a 1983 graduate of the same university. Three of the partners of the firm partnered with Afri-Projects Consortium to carry out the PTF projects between 1996 and 1999, leaving Hassan Umar to run the firm.

The most active member of the partnership with ACEN is Suleiman Adamu who worked with the Federal Capital Development Authority, FCDA, and the Water Resources & Engineering Construction Agency, WRECA, before founding the firm.

Major Projects carried out by Integrated Engineering Associates include Management Consultancy for PTF in a Joint Venture with APC, African Petroleum (AP) Plaza, Abuja, National Judicial Institute Permanent Site, Abuja, Suntilmawa-Dutse Water Supply Project, Jigawa State, New State Secretariat Complex, Dutse, Jigawa State, and Zakirai-Gujungu-Hadejia Road Project, Jigawa State

Oskar Jo 1989

Uujamhan was born in 1949, had his bachelor's and doctorate degrees from the University of Manchester, UK. He worked with Mandilas Nigeria Limited from 1974 to 1977, and was a research fellow at Brunel University from 1979 to 1981. He was a partner in a consulting engineering firm from 1981 to 1989 before establishing Osca-Jo in 1989. Some of their major projects include the 200 bed specialist hospital in Edo state and a 33 KV line from Ugbowo to NIFOR.

ENCON Associates 1989

ENCON Associates is a civil engineering consulting firm founded by Engr. Paul Abiyou in 1989. Major projects include Amadi-Ama Erosion Control Works for Rivers State Government (1994), Odi-Trofani Road with five major bridges for NDDC 2006, Design of Yenagoa-Oporoma Road for Bayelsa State Government (2008)

Afri-Projects Consortium 1990

Afri-Projects Consortium was the initiative of a quantity surveyor, Salihijo Ahmad. In 1990, he conceived of a multi-disciplinary professional practice and invited four of his friends, Abdurrahman Dahiru, Nurudeen Rafindadi, Amina Ibrahim and Murtala Aliyu to join him to create APC. The role of Afri-Projects Consortium in the management of PTF projects, and the profiles of the founders of the firm have been earlier discussed.

Salihijo died in 1999. Abdurrahman Dahiru and Amina Ibrahim have moved on to do other things. The firm is now run by Nurudeen Rafindadi, an active member of ACEN and the current vice president.

Some of the projects carried out by Afri-Projects in the recent past include Legal and Regulatory Framework for the Telecommunication Sector in Nigeria (in association with Booz-Allen and Hamilton, USA) for the Bureau of Public Enterprises (2001), World Bank Assisted Country Road Project for the Bauchi State Government (2001), Survey and Engineering Design of Aba-Ikot Ekpene-Uyo Road Dualisation (in association with Joint Consultancy Associates) for the Niger Delta Development Commission (2002), Rehabilitation of Bakalori Irrigation Project for the Federal Ministry of Water Resources (2000) and Condition Survey, Design and Specificatins for the Rehabilitation of 12 General Hospitals in Adamawa State (2007)

Dovates Associates Ltd. 1991

Segun Doherty was the honorary secretary of ACEN from 1985 to 1986 and has remained an active and committed member of the association. Born in 1943, he attended Igbobi College, Lagos and the University of Aston, Birmingham where he obtained his bachelor's degree in chemical engineering. With little opportunities for chemical engineers, he worked with the electrical firm of Kunle Okunoren & Partners before forming his firm, Dovates Associates Limited in 1991. Some of their projects are the feasibility studies for a liquefied petroleum gas filling plant of 150 bottles per hour (1992), the study of an export petroleum refinery in Nigeria (1994), and engineering evaluation of present day value of Aladja Steel Mill (1992).

Mekon Associates 1991

Engr. E. C. Okeke was born in 1938 and got his bachelor's degree in engineering in 1964. He was commissioned in the Nigerian Army Electrical and Mechanical Engineers (NAEME) Corps in 1964 and retired in 1971 as a Captain. From 1971 to 1978, he was employed variously by Continental Motors and Engineering Company Ltd., Thermocool Engineering Company Ltd., Vespa Assembly Plant and R. T. Brisco. From 1978 to 1991, he was principal partner, Yaroson and Partners in charge of southern zone. He revived Mekon Associates, a firm he had formed in 1977, in 1991. Projects handled by MEKON include Nerfund Head Office, Abuja (1992), NITEL Office Building, Abuja (1994), 33/11KV Substations at Osogbo and Sagamu.

Tamilore Associates 1992

Tamiore Associates was registered in 1984 but did not commence business until 1992. The founder, Engineer (Dr.) Temilola Kehinde,

was educated at the University of Lagos where he graduated in Mechanical Engineering in 1972. He later obtained an M. Sc degree from the University of Birmingham in the U.K., and a Ph.D degree from Stanford University, California, USA. He also has an MBA with specialization in finance. He is a member of the Nigerian Bar Association. Between 1986 and 2002, he served variously as the Lagos State Commissioner for Special Duties, and the Environment and Physical Planning.

Major projects carried out by Tamilore Associates include the Redesign of Mechanical Services for the Rehabilitation of Investment House (1998), Design of Electrical and Mechanical Services for the School of Environmental Technology, Abubakar Tafawa Balewa University, Bauchi (1994), the Redesign of Electrical Services for the New Lapal House in Lagos (2003), and Technical Advisory Services for the Privatisation of the Electric Meter Company of Nigeria, EMCON, (2002) among others.

Kabir & Associates 1995

Kabir and Associates was founded by Engr. Kabir Umar in 1995 and became a limited liability company in 2005. Engr. Kabir Umar was born in Funtua in 1954 and had his secondary school at Government College, Keffi. He graduated in civil engineering from the Ahmadu Bello University, Zaria in 1977. He worked with the Kaduna State Government until 1995 when he resigned to form Kabir and Associates. He returned to government briefly in 2003 and finally retired voluntarily in 2005 as a director.

Major projects carried out by Kabir and Associates include the Supervision of the Rehabilitation of Roads in Sokoto State 1996-1999, Survey and Design of Jibia-Kaura-Gusau Road, Design, Review and Supervision of Several Roads in Katsina State 2005 to date, and Design of Livestock Model Market 2008.

CPMS Limited 1998

Comprehensive Project Management Services Limited, CPMS, was founded in 1997 by Bayo Adeola as a wholly project management company. Bayo Adeola was born in 1951, had his secondary education at King's College and his first degree in civil engineering from the University of Lagos. He obtained his master's degree from Imperial College London. He worked with the firm of Adeyemi Ogundipe and Partners from 1976 to 1984, and was a partner in the successor firm of AOP-Consult Limited from 1984 to 1997. He resigned in December 1997 to found CPMS.

CPMS is best known for its pioneer status as the first wholly project management company. Notable projects managed by the company include the Regional Plan Preparation for Ogun State Government, Guaranty Trust Bank Branches, Mass Housing Development for Lagos State Government and the nine-storey, 22-apartments Cooper Road Development.

Prof. I.I. Ezebuiro (EDIFIC)

Prof Ezebuiro made significant contribution to the writing of this book. He taught telecommunications, electronics, and computer engineering at several overseas universities before returning to teach in Nigeria in 2000. He holds degrees from the University of Technology Giessen-Fredberg, Germany; Aston University, UK; the Union Institute and University, US; and Greenwich University, Australia. His Bachelor and Master's degrees are in Telecommunications/Electronics and Electronic Physics; his Ph.D. is in Electronics and Computer Engineering, and his Doctor of Science degree is in Engineering Science and Information Technology. He is presently the Provost of the College of Natural and Applied Science, Novena University, Benin City.

A comprehensive list of ACEN member firms as at June 2009 is presented in Table 8.

A review of the members' profiles presented above shows that the Nigerian consulting engineer had the best of training in the secondary and tertiary institutions attended both within and outside the country. Where the opportunities had been given, he had indeed given a very good account of himself. The list of projects executed in the face of a difficult political and economic terrain is also impressive. Most of the high rise buildings in the country have been designed successfully by local firms. Much of the highways and bridges have also been locally designed. Even when architecture was still dominantly in the hands of expatriate firms, Nigerian engineers were found capable of providing structural and services designs of international standard.

The greatest challenge has been in the sustainability of the firms. Fifty years after the first consulting engineering firm, most consulting firms remain small and are just managing to provide subsistence living for their owners. Most of the pioneer firms have not survived their founders and are no longer in existence. Unecon, Vasons Concept, Morgan Omonitan &Abe are some of the few firms that have survived their

founders. Several of the older individual members of the association are currently challenged by the difficulty of succession in their firms.

It is a pity that a profession that attracted the best educated Nigerians and is as critical to development is allowed to decay due to lack of appreciation of its potential by successive governments in Nigeria.

Table 8 List of ACEN Members as at 30 June 2009

1. A.A.Williams & Partners
2. AD Team Limited
3. Adebab Associates
4. Adoc Associates
5. Adstruc Associates
6. Advanced Engineering Consultants
7. Afkon Associates
8. Afri-Projects Consortium
9. Agbo-Mire Engineering Consultancy
10. Aim Consultants Limited
11. Amal Engineering Services Ltd.
12. Amana Consortium Ltd.
13. APTEC Engineering Ltd.
14. AR-AR Partnership
15. Aserima Associates
16. Asonic Associates
17. Atlas Int. Engineering Services Nig. Ltd
18. A.U. Consult Ltd.
19. Baba Konsult
20. Bisfun Limited
21. Bush-Wool Engineers
22. CA Consultants
23. CAD Nig. Ltd
24. Celmeng Associates
25. Challenge International Associates Ltd
26. Chief Corner Stone Engineering
27. Christ Epas Konsult
28. Civ-Struct Associates
29. Ciwat Engineering Consultants
30. Comprehensive Engineering Consultant
31. Comprehensive Project Management Services Ltd.
32. Consem Associates
33. Cristal Global Engineering Ltd
34. Cyno-Lawrence Nigeria Limited
35. Cypress Konsult Ltd.
36. Danelec Nigeria Ltd.
37. Dean & Partners
38. Debs Foundations
39. Decrown (West Africa) Company Limited
40. Deenlaw Associates
41. Delkem Associates
42. Delmek Consultants
43. Deltec Engineering Ltd.
44. Deltech Associates
45. Diks Consultancy Services
46. Diyokes Consultants
47. DMG Associates
48. Double Q Int. Ltd
49. Ebcon Engineering & Construction Ltd
50. E-Christus Consult
51. Ecological Consultants
52. Eco-Systems Konsult
53. Efaesan and Partners
54. Elens Konsult
55. Emdec Consult
56. Emak Consult Nig. Ltd.
57. Emifan Services
58. Emikat Associates
59. Emms Consulting Engineers
60. Encon Associates
61. Endev Associates
62. Engee Nigeria Ltd.
63. Etteh Aro & Partners
64. Ekcel Konsultants
65. Faithline Ltd.
66. Fatia Engineers
67. F.A.O. Phillips & Associates.
68. Femak Associates
69. Frekan Consultants
70. Frugal Consult
71. Fyne Chima Ogolo & Company Ltd.
72. Gaiwan & Associates
73. Gapec Consultants Limited

74. Gbalmek Consultancy & Engineering Ltd.
75. GKW Nig. Ltd.
76. Global Works Consultants
77. Gomet Associates Ltd
78. Hansom Engineering Consultants
79. Haskoning Engineering
80. Hassan & Partners
81. Hydra Consultants
82. Hydroplan Engineers
83. I3M Limited
84. Icecon Nigeria Ltd.
85. Impact Engineering Ltd.
86. Interactive Engineering Consult
87. Isu Associates
88. Intecon Partnership
89. Integrated Advanced Analysts Ltd.
90. Integrated Engineering Associates
91. International Building and Civil Engineering Company
92. Interplan Engineers
93. Jabidep Nig. Ltd
94. J.B. Comayo Associates Ltd.
95. Jibok Engineering Limited
96. Jil Engineering Associates
97. JOD Partnership Limited
98. Johacon Associates
99. Jojo & Partners
100. Jokiatosam Engineering Limited
101. Kay-Dek Associates
102. Kabir & Associates Ltd.
103. Kayis Consulting Engineers
104. King Associates
105. Koladun Associates
106. KOA Consultants Ltd.
107. Kreek Konsult
108. Kuhl Associates
109. Landgold Consulting Engineers
110. Landmark Integrated Technologies
111. LTG Technologies Ltd.
112. Living Stone Consultants
113. Mains Engineering Nig. Ltd.
114. Maths Konsult (Nig.)Ltd.
115. Masodak Associates
116. McAdog & Associates
117. Melandy & Partners
118. MFA Partnership
119. Micro-Golem Nigeria Ltd.
120. Model Design Dev. Co. Ltd.
121. Morgan Omonitan & Abe Ltd.
122. Muffy Olaiya Associates Ltd.
123. Multidesign Partners
124. Mult-Engineering Solution and Design Ltd.
125. Nacon Consulting Engineers
126. Naseng Nig. Ltd
127. Newman Engineering Consultants
128. Oak Engineering Konsult
129. Open -Ended Ventures (Africa) Ltd.
130. Osac Engineering Limited
131. Olutemcom Associates Ltd
132. Omoya & Associates
133. Ot Otis Engineering
134. Oska- Jo & Partners
135. Ove Arup & Partners
136. Pacific Consultants
137. Pentagon Engineering Consultants
138. Pentron Consultants
139. Peem Engineering Associates
140. Pheman Peniel Consultants
141. Philip Ejiodu & Partners
142. Pinconsult Associates
143. Power Management Associates
144. Precision Tech. Consultants
145. Profen Consult
146. Progress Engineers
147. PSE Consultants Ltd.
148. Qiblat Associates Ltd.
149. Resca Services Nig. Ltd.
150. Rindex Associates
151. Rhodel Associates Ltd
152. Rock Associates
153. Rotab Associates
154. Roughton International
155. Sabby Works Ltd
156. Sahael Associates
157. Salima Engineering Ltd.
158. Samabot & Associates
159. Sani Mustapha & Associates
160. Sanol Engineering Consultants
161. Siblak Nuel Associates
162. SKI Ilugbekhai & Co
163. Sobek Consult Limited
164. Spick Associates
165. Sshwed Associates
166. Standard Consult
167. Strategic Research Consortium
168. Status Associates
169. Suenco Engineering
170. Supreme Engineering Consultants
171. Tando Associates Ltd.
172. Tamilore Associates
173. Tata Messiri Consultants
174. Teamwork Global Associates
175. Tegriti Proacti Limited
176. Thamar Engineering Com. Ltd
177. TOG Environment & Infrastructure Ltd.
178. Tohoba Associates
179. Trecons & Partners
180. Trust-Eng Associates
181. Tuns Consultants Ltd.
182. Ultimate Engineering Associates
183. UM Associates
184. Uzec Associates Ltd.
185. Unecon Associates
186. UNI Konsult
187. Union Consultants
188. Vaastrup Nig. Ltd
189. Vasons Concept Consultants Ltd.
190. Viable Engineering Consultants Ltd.
191. Vibro Engineering Company Limited
192. VIN Associates
193. Waltech Engineering Services Ltd.
194. Water & Dam Services Company
195. Yuwa Ikume & Partners
196. Y.Ahmed & Associates
197. Yolas Consultants
198. Zephyrgold International Ltd.

CHAPTER 10


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ACEN
INSURANCE
COMPANY PLC
RC: 107, 117

ACENICO

CHAPTER 10

ACENICO

Images Opposite:
a. EA Oyetoyan
b. FAO Phillip
c. Tunde Oshadiya
d. JO Maduka
e. JO Sonuga
f. MO Adesina
g. Yemi Songunuga
h. Obi Obembe
i. SO Fadahunsi

ACENICO

A major achievement of ACEN was the formation of ACEN Insurance Company, ACENICO. The decision to form an insurance company was taken around 1986 when Dr Sonuga was president. Members of ACEN saw it as an opportunity to create sustainable income for themselves and the Association by providing needed services to the industry. Firms of members, and the contractors who worked with them on projects needed insurance services such as professional indemnity, advance payment and performance bonds, contractors' all risks, personal accident and similar covers. ACEN therefore took the initiative to form this company. Many senior members of ACEN, including past presidents F. A. O. Phillips, Obi Obembe and Engr. S. O. Fadahunsi fully supported the project and invested time and money in it. The project implementation was, however, led by past president Adenrele Adejumo and Yemi Songonuga, a member of the ACEN Council at the time and Debo Adeoye, who later served as the honorary secretary of ACEN for several years.

The genesis of ACENICO was, however, in FIDIC. ACEN joined the International Federation of Consulting Engineers, FIDIC in 1977. FIDIC works through committees, and had set up several of them to address issues important to member associations. One of such was the Risk Management Committee which addressed issues of liabilities of member firms on projects. Engr Adenrele Adejumo had served on this committee for several years and would discuss their deliberations at ACEN Council meetings in Lagos. The topic of professional liability greatly fascinated Engr. Songonuga and he would seek to find out more. At the FIDIC conference in San Francisco, USA in 1985, Engr. Adejumo introduced Engr. Songonuga to the Risk Management Committee, given his interest in the subject.

Yemi Songonuga obtained his bachelor's degree in engineering from the University of Belfast in 1967 and a post graduate diploma in town planning from Glasgow in 1970. He returned to Nigeria in 1971 and worked as a town planner with the Western State government. He was posted to Abeokuta as the Regional Zonal Officer for the present Ogun State. He resigned from government in 1973 and worked with Onafowokan City Scape Group from where he resigned and formed Vasons Concept, an engineering consulting firm.

Engr Songonuga thereafter continued to attend the Risk Management Committee meetings at FIDIC conferences. At one of such conferences, he met a gentleman from New Zealand who discussed how the New Zealand association had formed an insurance company to address the issue of professional liability. This way, both the consulting industry and the insurance industry benefited from the venture. Songonuga was greatly fascinated by this. On returning home, he discussed the concept at the next Council meeting of ACEN. Members were interested in the idea but emphasised that they did not have the capital to form an insurance company. It was agreed that he could present a detailed proposal for such a company, which he did. The Council deliberated on the proposal and approved it. A committee was set up with Songonuga as its chair to implement the plan.

Not having any revenue allocated to the venture, Engr Songonuga invited his lawyer brother, Femi Songonuga to help register an insurance company. On a pro-bono basis, ACEN Insurance Company was registered on the 25th of January 1988. The authorised share capital was one million Naira, and the founding board members included the then president, Engr Sonuga as chairman of the company, past presidents F. A. O. Phillips, Obi Obembe and Adenrele Adejumo, and the promoter Songonuga.

Having registered the company, ACEN Insurance had to obtain the necessary permits to practice the business of insurance. Being a field completely different from engineering, Songonuga had to learn how the business of insurance was operated. In this respect, two childhood friends of his were very supportive and assisted him in this process. One was Alhaji Soji Quadri, an insurance broker who ran his own business, and the other was Venerable Kayode Cadmus who worked with the Royal Exchange Assurance. The documentation required for registration to practice insurance was elaborate and considerable. Dolapo Balogun, an engineering graduate who had been brought back to insurance by his father assisted in preparing the necessary documents. All these advice and input were given pro bono.

Part of the requirements for the licence to practice was the deposition of the share capital with the Central Bank of Nigeria, and members had to pay up for their shares. The response to the request for payment for these shares was very poor, and this poor response remained the bane of the company throughout its existence. In order to make up the amount required, an offer of permanent boards seat was made to any three people who would each put down 10% of the called up capital. Only two people volunteered from the ACEN council, Engrs Phillips and Obi Obembe. Unable to get a third person, Obi Obembe approached Engr S. O. Fadahunsi who agreed to come on board. Engr Fadahunsi was impressed that engineers

were thinking outside the box in going into other businesses outside core engineering. The board membership was thus increased to six. Even then, the amount required for the Central Bank deposit was still not realised and Obi Obembe had to provide a loan to the company.

On the 20th of November 1989, twenty-two months after registration, the company was duly registered and allowed to operate as an insurance company. ACEN had been warned that any reference to the company as an insurance company before the licence would attract severe penalties. The first office was at Great Nigeria House at Balogun in Central Lagos. The first General Manger was Mr Idowu Silva, who only lasted three months. His assistant, Mr E. A. Oyetoyan took over as acting General Manager, and was to be the CEO of the company for several years.

ACENICO continued to grow with some minor challenges. One of the earliest challenges was to distinguish between the responsibilities of the board of ACENICO and ACEN Council. At its formation, all the members of the board were from ACEN, and everybody was considered as representing ACEN. Dr Sonuga had become the chairman of the board largely because he was the president of ACEN at the time. With the increasing need to raise capital, several ACEN members had bought shares in ACENICO, some on behalf of ACEN, and others directly for themselves. In recognition of the amount of shares bought, the three largest investors were given permanent seats on the board. This situation was generally satisfactory at the time as all the board members were still active on ACEN Council and would regularly brief the Council on the board and company activities.

As time went on, however, Dr Sonuga's tenure as ACEN president ended and he was succeeded by Engr Oyefodunrin who was not on ACENICO board. Although past presidents are members of ACEN Council, they are not obliged to play very active roles. Engr. Songonuga thus became the only board member obliged to attend ACEN council meetings. He was therefore considered as the only board member representing ACEN on ACENICO board. This situation was not considered satisfactory by ACEN council members who saw ACENICO as their company and every board member as representing ACEN. The permanent board members, however, wanted some degree of independence and to be relieved of their responsibility to ACEN. The debate on this issue went on for several years and was usually emotional and sensitive. By 1996, ACEN council finally accepted the reality of the independence of the permanent members and sought to nominate members directly to the board of ACENICO. At the AGM of ACEN in 1995 when Dr. J. I. Folayan was president, a resolution was passed proposing amendments to the Articles & Memorandum of Association of ACENICO as follows:

> Article 56(a)(1) to read "Group A Directors who shall not be less than six (6) Directors and nominated by Group A shareholders with the proviso that ACEN shall nominate four (4) of the six (6) Directors at all times."

It was also proposed that the chairman of the Business/International Activities Committee and the president of ACEN or his nominee who must be a past president shall as a matter of policy be among the four members to be nominated by ACEN to the board of ACENICO. This motion was never adopted by ACENICO board. A modified form in which ACEN was represented by only two members, the President and his nominee, was later adopted when Okunoren became president. Thereafter, ACEN representation on ACENICO board became limited to these two persons, with Aremo Kunle Okunoren and his nominee, Bayo Adeola, being the first representatives. The permanent board members finally had their freedom.

Another view of ACENICO by ACEN council was that it should provide financial and business support to ACEN. As far as they were concerned, this was the primary reason for setting up the business. The Council therefore passed motions requesting ACENICO to provide office space for ACEN secretariat, support their conferences, as well as sponsor commercial advertisement on the activities of ACEN on national media. The board, on the other hand, continued to see itself as having a business to run and essentially independent of ACEN and was not always positively disposed to these requests and did only the minimum that it needed to do. A regular support was the sponsoring of the production of conference bags at annual conferences.

ACENICO also faced the challenge of capitalisation. In order to meet working capital requirements, the authorised share capital was increased five times between 1990 and 1996; from =N=1.0 to =N=3.0 million in 1991, =N=3.0 to =N=5.0 million in January 1992, =N=5.0 to =N=10.0 million in September 1993, =N=10.0 to =N=25.0 million in August 1995 and =N=25.0 to =N=50.0 million in October 1996. A major financial challenge came in April 1997 with the new Insurance Decree No. 2 of 1997 which required that any company underwriting special risks such as bonds, engineering, contractors all risks, erection all risks, marine and aviation, oil and energy

should have their minimum paid up capital raised to =N=70 million. The decree specifically stated as follows:

a. In the case of life insurance, not less than =N=20 million
b. In the case of general insurance business, not less than =N=20 million
c. Where the general insurance business includes any of the following:

- Oil and gas insurance business
- Credit insurance business, bonds and surety-ship
- Contractor's risk and engineering risk insurance business
- Marine and aviation insurance business, other than goods in transit business by road, water, air and rail, an additional paid-up capital of not less than =N=50 million is required

ACEN paid up capital at this time was only =N=10.0 million.

In response to this decree, the authorised share capital of ACENICO was increased from =N=50 million to =N=100 million and 70 million shares of =N=1.0 each were to be paid up. This would require additional 60 million shares. ACENICO board, realising the difficulties it had had in the past raising capital from members, immediately became apprehensive that the present shareholders were not likely to provide the additional capital needed and more shareholders would need to be invited to subscribe. ACENICO would therefore need to become a public limited unquoted company as the number of shareholders would exceed fifty. The shares would, however, not be available on the stock exchange as an unquoted company. Rights offer of three new shares for every one share would be made to existing share holders to bring their =N=10 million to =N=40 million capital by 30th of June 1997. The remaining =N=30 million would be raised by inviting all engineers and engineering organisations to invest by private placement.

The implications of these resolutions were serious. For the first time, ACENICO shares would be offered to persons outside ACEN. ACENICO would no longer wholly belong to ACEN. At the time, ACEN and its members owned 90% of the shares, the remaining 10% being left for ACENICO staff. If all existing members took up their rights, then ACEN and its members would have 40 out of the 70 million shares and still retain control. If ACEN rights offers were not taken up at all, then only 10 million out of 70 million would remain in ACEN. ACEN itself had only 11% of ACENICO shares directly, and would need =N=3.3 million to take up its rights offer. A decision was taken to levy each member =N=10,000 to be able to take up this offer and retain its percentage holding.

Task forces were set up by both ACEN and ACENICO to drive the capitalisation effort. First City Monument Bank, FCMB, was engaged to raise the necessary capital and the lists of ACEN and NSE members were provided. The bank prepared the necessary brochures and circulated them widely to all engineers. ACEN task force used every opportunity to present the company's case to its members at both ACEN and NSE events.

But these were very difficult times for consulting engineers generally, and membership of ACEN had waned considerably. Several of those who remained committed to the Association were having problems sustaining their firms. It is against this background that the difficulties experienced in re-capitalising must be appreciated. At the end of the day, only =N=1.4 million could be raised by ACEN. Again selfless and committed ACEN members decided to domicile their shares to ACEN so that the 3.3 million could be made up.

Despite the fact that the re-capitalisation exercise started in April 1997, and the closing date was changed three times from June 1997 to December 1997 and December 1998, by the time the list of approved insurers for the various categories came out in April 1999, ACENICO had not been able to meet the minimum paid-up capital required. In a report to the Extraordinary General Meeting of ACEN on the 11th of June 1999, the then managing director, Mr. E. A. Oyetoyan reported that as at March 1999, only =N=34 million had been realised, which meant that ACENICO could no longer underwrite engineering risks, the area for which it was best known. The National Insurance Commission, NAICOM, had on the 27th of April 1999 released a list of 74 approved insurance companies of which only 14 had met the minimum capitalisation for all categories of insurance. The fact that ACENICO was in the same problem as others was not a consolation. Having been formed by engineers with a view to covering engineering business and now being de-listed from the category was very painful. The company was now playing in the second league and was being excluded from the major businesses in the industry. It needed to find a way to resolve the problem. The situation was now desperate.

At the Extraordinary General Meeting of ACENICO held on the 28th of April,

1999, the shareholders resolved and agreed that the company should set up a new recapitalisation committee to be responsible for the full recapitalisation of the company including the sale, merger and acquisition of up to 49% of the company's shares required for full recapitalisation in compliance with the Insurance Decree 1997 without loss of the company's name and identity. Only three board members and five shareholders were present. The generality of shareholders had lost faith and were willing to let go of the company. The board met immediately after the EGM, adopted the resolution and set up the committee with the new mandate.

At the board meeting of 28 September 1999, the chairman of the recapitalisation committee, Engr. Fadahunsi recounted the efforts of the committee to secure contributions from the Federation of Construction Industries, FOCI, the Nigerian Society of Engineers, NSE, NSE Ventures and the Council for the Regulation of Engineering in Nigeria, COREN, without any success. Various other non-engineering companies made offers, and the offer by Belton Concept Consultants, a firm of investment consultants was looking interesting. The company made an offer for 40% of ACENICO shares, that is, 28 million shares at =N=1.0 per share amounting to =N=28 million and this was accepted.

The recommendations of the Committee in respect of the Articles and Memorandum of the Company were as follows:

The shares of the Company shall be divided into three classes:

1. The first class shares shall comprise not less than 51% of the Authorised Share Capital of the Company which at any given time shall be held by the Association of Consulting Engineers Nigeria (ACEN), the Nigerian Society of Engineers, (NSE), and other engineering bodies and their members

2. The second class of shares shall comprise not more than 44% of the Authorised Share Capital of the Company which at any given time shall be held by non-engineers and other members of the public.

3. The third class of shares shall be 5% of the Authorised Share Capital of the Company which shall at any given time be held by the employees of the Company.

The committee also recommended that the board be re-constituted as follows:

> Two permanent members, four from the core investors, one for ACEN, one for NSE, the managing director and three others, to take effect from January 1, 2000.

On the 25th of January 2000, the 93rd board meeting was held, attended by both the out-going and in-coming directors. The new board members included Messrs Mabel Iwobi (alternate Tony Iwobi), E. I. Gomos, Ijem Onwuamaegbu and P. O. Arah representing Belton Concepts Limited, Ralph Eke (NSE), M. O. Adesina (ACEN), and Engrs. Mrs. J. O. Maduka, R. O. Soderu and G. A. Legunsen. The two remaining permanent members of the board (Engr. Obi Obembe had relocated to Canada and was no longer active in the company's activities), Engrs. F. A. O. Phillips and S. O. Fadahunsi, and the Managing Director, E. A. Oyetoyan would continue to seat on the board. The retiring board members included the chairman since the inception, Engr. Dr. Sonuga, Engrs. A. A. Songonuga, S. I. Nyagba, I. A. A. Okunoren, E. J. Amana, A. A. Adejumo and K. A. Adeola.

Dr. Sonuga started his last meeting as chairman at 12.05 pm with a silent prayer and welcomed both the old and new members. He gave a review of the development of the company from its formation in 1988 as a wholly ACEN company with a capital of =N=1.0 million to the present capitalisation of =N=70 million with mixed ownership and a core investor. It was also symbolic that the company had just relocated to a new office on Ikorodu Road. Engr. Phillips thanked the outgoing chairman for his services and commitment over the years and wished him success in his future endeavours. Engr. S. I. Nyagba, speaking on behalf of all outgoing members, expressed his appreciation of the successful recapitalisation achieved by the old board of directors and promised to continue to support the company. Upon a motion of adjournment by Engr. Okunoren, and seconded by Engr. Songonuga, the chairman declared the meeting closed at 12.55 pm.

A phase in the life of ACENICO was ended.

Although there was now a core investor with a holding of 40% of the company, Mr Tony Iwobi, the chief executive of the investing company, was reported by all as an excellent gentleman who was satisfied to leave the culture of the company intact and maintain its image as an engineering-

driven company. Despite the considerable dilution of their shares, he allowed the permanent members to continue on the board. Immediately after the joint meeting, the new board met and elected Engr. Chief S. O. Fadahunsi as its chairman.

Emmanuel Ayo Oyetoyan had been with the company since it started business in 1989. He graduated from the University of Ibadan with a bachelor's degree in Sociology in 1979 and worked briefly with the Kwara State Ministry of Social Development. In search of a more fulfilling career, he moved to Lagos and was employed as a graduate trainee in 1981 by Law Union & Rock, a very prominent insurance company in Nigeria. He worked there for about nine years and was trained in all departments of insurance, including engineering insurance which was considered by most practitioners as difficult. It was from there that he was head-hunted into the new ACEN Insurance Company. Employed as a Deputy General Manager in September 1989, he became the most senior staff and Acting General Manager within three months on the resignation of the first General Manager, Mr. Idowu Silva.

Oyetoyan witnessed the growth of the company and its travails of capitalisation and survived them all. He renovated the first ACENICO office in Great Nigeria House in November 1989, relocated to the new office at Lewis Street in 1995 and moved the company to its last abode on Ikorodu Road in 2000. He managed several re-capitalisation exercises, from the modest =N=300,000 paid up capital in 1989 to =N=70 million in 2000. Not only did he carry out his work diligently, he also invested in the company thus demonstrating his commitment. Table 9 shows the statement of account for the period 1995 to 2000 and the growth of the company under his leadership. Its assets grew from =N=28.65 million in 1995 to =N=134.56 million in 2000, its gross premium grew from 50.45 million to 120.78 million, but its profit after tax fluctuated.

On achieving the =N=70 million capitalisation, a new executive director, Mr. Arah, came on board from the new core investors, and five other senior professionals were employed. With a new board came new complexities and Oyetoyan resigned his appointment in September 2001 after approximately twelve years of service to ACENICO.

Oyetoyan was succeeded by Tunde Oshadiya as the acting chief executive immediately upon his resignation. A 1985 graduate of Insurance from the University of Lagos, he had worked in several insurance companies before

Table 9 Summary of Company Financial Statements 1995 - 2000

	1995	1996	1997	1998	1999	2000
Fixed Assets	3,283,419	6,696,655	10,552,396	11,257,825	14,999,635	19,399,269
Statutory Deposit	2,500,000	2,500,000	2,500,000	10,500,000	10,500,000	10,500,000
Long Term Investment	1,800,000	1,600,000	1,000,000	1,250,000	250,000	250,000
Net Current Assets	21,060,608	21,462,111	36,190,719	39,114,901	81,877,783	104,412,788
Assets	28,646,022	32,260,762	50,245,112	62,124,724	107,627,418	134,562,057
Share Capital	10,000,000	10,000,000	24,781,000	33,429,000	70,000,000	70,000,000
Share Premium	0		564,000	564,666	564,000	564,000
Bonus Reserve	0	2,000,000	25,500			1,939,300
Profit & Loss Account	(1,330,132)	252,691	666,951	433,136)	548,738	610,240
Insurance Fund	17,793,367	16,395,565	19,497,652	22,548,765	28,921,503	51,237,503
Contingency Reserve	2,180,812	3,610,510	4,743,512	6,018,597	7,593,177	10,211,014
	28,644,027	32,258,766	50,243,115	62,122,726	107,627,418	134,562,057
Gross Premium Income	50,457,408	54,290,498	66,079,184	69,376,944	77,626,857	120,778,422
Profit After Taxation	(1,870,872)	5,900,741	2,452,262	1,036,619	2,586,454	4,890,440
(Expenses of Recapitalisation)	(235,650)	(388,200)	(905,000)	891,621)		
Dividend						(1,750,000)
	(2,106,522)	5,512,541	1,547,262	144,998	2,586,454	3,140,440

Initially, Oyetoyan's challenges were two, he had to operate with relatively low paid up capital with continuously increasing benchmarks; and consequently, he could not employ the quality of staff he considered necessary for successful running of the company. He, however, put together thorough and professional systems, standards and administration that were appreciated by the insurance industry in general and his successor in particular.

On achieving the =N=70 million capitalisation, a new executive director, Mr. Arah, came on board from the new core investors, and five other senior professionals were employed. With a new board came new complexities and Oyetoyan resigned his appointment in September 2001 after approximately twelve years of service to ACENICO.

Oyetoyan was succeeded by Tunde Oshadiya as the acting chief executive immediately upon his resignation. A 1985 graduate of Insurance from the University of Lagos, he had worked in several insurance companies before joining ACENICO as the Deputy General Manager for Marketing and Business Development on the 1st November 2000. He was soon to be confronted with another capitalisation requirement by NAICOM.

Table 10 shows the summary for the company between 2001 and 2005. ACENICO recorded steady growth, The Company's total assets which stood at =N=181.41 million in 2001 had risen to =N=521.222 million by 2005, while its shareholders' fund which stood at =N=72.73 million in 2001 appreciated to over N300 million. Its profit after tax had grown from =N=8.77 million to =N=79.27 million and its gross premium income from =N=174 million to =N=404 million.

The next capitalisation challenge came in 2003, but had been anticipated since 2002. At the Extraordinary General Meeting of ACEN held on the 18th of July 2002, Mr Oshadiya informed ACEN members that a new insurance bill passed by the National Assembly had again raised the paid up capital for insurance companies from =N=70 million to =N=200 million. He presented the options available to ACEN towards raising the =N=130 million that would be required. In addition to rights issue to members and lobbying investors through private placement, other options included merging with other insurance companies; going to the capital market to raise the funds; and seeking out a core investor to provide the capital.

The insurance law came into effect following the endorsement of the Act by President Olusegun Obasanjo on May 27, 2003 and gave insurance and reinsurance companies only nine months to recapitalise. The Act stipulated new capitalisation for the different sectors of insurance business as follows:

> *"in the case of life insurance business, not less than =N=150 million; general insurance not less than =N=200 million; composite insurance business not less than =N=350 million; or reinsurance business not less than =N=350 million."*

ACENICO opted for the general insurance option which required a capitalisation of N200 million. At the next AGM, the shareholders approved an authorised share capital of N250 million, of which N200 million would be called up.

Table 10 Summary of Company Financial Statements 2001 - 2005

	2005	2004	2003	2002	2001
Fixed Assets	61,935,808	55,412,191	45,779,896	22,566,365	18,354,133
Statutory Deposit	20,000,000	20,000,000	20,000,000	10,500,000	10,500,000
Long Term Investment	33,928,612	29,462,112	348,500	250,000	250,000
Net Current Assets	406,156,837	310,796,549	294,812,076	151,660,533	104,412,785
Assets	521,221,257	415,670,852	360,940,472	184,976,898	181,414,365
Share Capital	250,000,000	250,000,000	200,000,000	76,650,379	72,733,936
Share Premium	19,612,286	20,222,609	22,108,909	564,000	564,000
Bonus Reserve	50,000,000	0	0	0	0
General Reserve	30,532,588	14,146,720	2,913,180	1,786,987	1,044,138
Insurance Fund	109,873,028	91,526,491	112,167,534	87,594,392	73,157,320
Deferred Tax	10,716,053	8,191,507	0	0	0
Contingency Reserve	50,487,302	31,583,525	23,750,849	18,181,140	13,914,969
	521,221,257	415,670,852	360,940,472	184,776,898	161,414,363
Gross Income	404,451,541	301,871,501	235,449,553	180,260,514	173,989,426
Profit After Taxation	79,265,413	49,066,216	26, 695,902	14,611,428	8,774,550

The company decided on a public offer and initiated activities in this respect. It sought to raise about =N=130 million to add to its then just over =N=70 million share holders' funds. One of the directors, Engr. Legusen, introduced the firm of Integrated Trust and Investment Limited, ITI, to drive the public offer. The chairman of ITI was Mr Lawore who was to play a critical role in the unfolding events. ITI agreed to underwrite 30% of the offer on condition that the company would have the first right of refusal if the offer was undersubscribed, and that it would also be the stockbroker for the disposal of the shares when necessary.

The offer opened in November 2003 and was to close on the 24th of December 2003. Intercontinental Bank Plc and Wema Securities & Finance Plc (Wemasec) were the joint issuing houses to the offer. The response to the public offer was not encouraging and application for extension of time had to be made to SEC. In response to this application, the Vanguard Newspaper published the following article:

The Securities and Exchange Commission (SEC) has approved the extension of the on-going Initial Public Offer of ACEN Insurance Company Plc (ACENICO) from December 24, 2003 to January 13, 2004. The two weeks extension is in response to popular demand by numerous Nigerians who are yet to submit their application forms due to delay in receipt of offer documents in their areas coupled with expenses and travelling occasioned by Christmas and New-year festivities. Many corporate investors who have closed their books for the year have also requested for the extension so that they may obtain their investments committee decision on ACENICO's public offer in early January 2004. Consequently, the extension is expected to give opportunity to all spectrum of the Nigerian investing public to participate in the IPO of ACENICO which is a prelude to its seeking quotation on the Nigerian Stock Exchange.

ACEN Insurance Company Plc was a centre of attraction at the recently concluded Nigerian Society of Engineers (NSE) conference tagged "LAGELU 2003" as Nigerian engineers of all areas of specialisation, be it mechanical, civil, petroleum and others jostled for ACEN Insurance Company Plc (ACENICO) shares under its on-going Offer for Subscription of 192,598,484 Ordinary shares of 50 kobo each at 70 kobo per share. Apparently, the engineers' enthusiasm was in response to the appeal sent out by the Association of Consulting Engineers Nigeria (ACEN), the original promoters of ACENICO, that Nigerian engineers should take active interest in ACENICO's public offer so that the company may continue to be one of the legacies of the engineering profession in Nigeria.

At the end of the offer period, it was undersubscribed. In addition to the 10 million shares ITI had taken, it accepted to underwrite the offer according to its contract and the board was able to announce to the shareholders at the 2004 AGM that the company had met the capitalisation requirements of =N=200 million. By this action, however, the structure of the company had changed again. There were now two institutional investors, ITI with the largest single investment at 24% and the Belton Concept with 15%. ACEN shares in ACENICO had whittled down considerably, from 5% to 2.5%. The managing director presented the list of the major shareholders as follows:

ITI Nominees Limited	24.31%
Belton Concept Limited	15.37%
Engr. G. A. Legunsen	7.5%
Engr. (Mrs) Mayen Adetiba	4.17%
Engr. (Chief) S. O. Fadahunsi	3.00%

Others with significant holding of between 2.5 and 3% include Engr. Dr. Edet Amana, ACEN, Mak-Trust Property and Investment Limited and Dr. Evans Aina.

The new investors took their seat on the board but allowed the permanent members to continue to provide the leadership. Engr. S. O. Fadahunsi continued as the chairman of the board while Engr. M. O. Adesina continued to represent ACEN. Unlike the Belton Group that essentially preserved the old organisational culture, ITI sought to influence the company more radically to reflect the reality of its being the single largest shareholder.

The final crunch came in 2006 when NAICOM again demanded recapitalisation for the industry, following on the heels of bank recapitalisation. The minimum paid up capital for banks had been increased from =N=2 billion to =N=25 billion, and this had reduced the number of banks from 84 to 25, with several mergers and closures. The insurance companies were looking much too small compared with the banks. Indeed, with the new bank capitalisation, one bank could buy up all the insurance companies in the country. New standards needed to be set. For Life Business the minimum capitalisation was raised from =N=150m to =N=2bn, General Business from =N=200m to N3bn, combined life and general business would require =N=5 billion, and re-insurance companies were required to raise =N=10bn to be re-certified, from the previous level of =N=350m.

Whilst the industry accepted the rationale for the consolidation, many insurers were concerned at the magnitude of the capitalisation increases. They also felt that the timing was unfair to the sector as it came towards the conclusion of the consolidation of the banking sector when the capital market had been repeatedly drawn upon by the banks. There were fears of market fatigue, normal investors' apathy for insurance stocks, and the high cost of the capitalisation exercise. It was strongly believed by some that government had sounded the death knell for many insurance companies.

ACEN was now well positioned in the industry and performing well as can be seen from their financial statements. There was, therefore, optimism that the company would clear the hurdle. The board was very proactive and immediately set up a recapitalisation committee headed by Engr. Legusen. The committee deliberated and recommended that the company should go for a public offer and appoint Fidelity and Wema Banks, each of which had agreed to underwrite 15% of the offer, as issuing houses. Both the board and the AGM approved the recommendations. Subsequent to these approvals, however, there was dissent by one of the institutional investors which stalled the public offer process. The situation could not be resolved amicably and dragged till December when the Security and Exchange Commission, SEC, had to intervene to resolve the impasse. ACENICO had lost valuable time. Its position was becoming precarious.

January 11 2007:
Eventually the board proceeded to raise =N=2.1 billion through a public offer and offered for subscription, three billion ordinary shares of 50 kobo each at 70 kobo per share. The offer opened on Monday January 8, 2007, to close on January 27, 2007. The proceeds of the offer, according to the then chairman, F. A. O. Phillips, would be used to position it in good stead ahead of its envisaged consolidation with other insurance companies and to provide the company with adequate working capital and funds. The company hoped that its market capitalisation after the offer would rise to =N=2.52 billion from its pre-offer shareholders' funds of =N=350 million.

The offer came out too late and was undersubscribed. The option left for the Company was to seek a merger. The time for closure of the recapitalisation exercise was drawing near, end of February 2007. Desperation was setting in.

Four merger options were evaluated, WAPIC, Crusader, Sovereign Trust and Top Edge Group. WAPIC was strong enough to go it alone and did not need any merger. By the time of the evaluation, Crusader was also well advanced in its consolidation process and ACENICO was no longer critical. Top Edge Group was a collection of small companies whose chances of meeting the minimum deposit required for registration were not certain. Sovereign Trust had reached a consolidation agreement with four other companies and their total shareholders' funds stood at =N=3.77billion. This put ACENICO at a disadvantage and an offer of two ACENICO shares to one of Sovereign Trust was made. Ten days to the deadline for registration, the board considered and accepted this offer as the best they could get. The chairman signed the necessary forms and proceeded on vacation. Before this arrangement could be concluded, however, a board meeting was called at which five members were present, the two to one share offer was reconsidered as not fair enough, and a decision to explore chances with another insurance company was taken. Sovereign Trust concluded its registration without ACENICO, and as the chances with other companies were not realised, ACENICO was left in the cold.

This impasse continued for several months. Sovereign Trust became listed and its shares continued to appreciate on the stock exchange. ACENICO, on the other hand, was not registered and therefore could not trade, but was not dissolved. It continued to maintain some staff and infrastructures, and its shareholders' funds continued to diminish.

Eventually, NAICOM prevailed on Sovereign Trust to absorb ACENICO and an offer was made reflecting a much stronger Sovereign Trust, and a much weaker ACENICO. Tunde Brown on www.stockmarketnigeria.com reflected the absorption in a web article on December 5, 2008:

5th December 2008

> *After several rebuffs by the shareholders of ACEN Insurance Plc on acquisition bids by insurance companies who made it through the recapitalization deadline, an approval has finally been granted for its acquisition by Sovereign Trust Insurance Plc. This is on a share exchange basis of 7 Sovereign Trust share for 85 shares in ACEN Insurance. Some of the shareholders expressed concern over the basis of exchange, but were consoled by the fact that the position was better than an outright loss in investment.*
>
> *The Chairman of ACEN Insurance Plc, Oba Adesina, at the Extra-Ordinary General Meeting said, "We are here for one singular purpose today, to receive your blessing for the acquisition of ACEN Insurance Plc by Sovereign Trust Insurance Plc, and I encourage you to support the acquisition." Shareholders then gave unanimous support, the acquisition being the only option for the company to grow. He further hinted that the last offer by the company was unsuccessful, adding*

that investors who subscribed to the offer would get their money back with interest.

It would be recalled that the stock of ACEN Insurance Plc was de-listed from the Nigerian Stock Exchange for falling short of certain listing requirements in a clean up exercise by the Exchange about two months ago. The Chairman and the Managing Director of Sovereign Trust Insurance Plc, Messrs. E. F. Faloughi and Onaolapo, attended the extra-ordinary general meeting as observers.

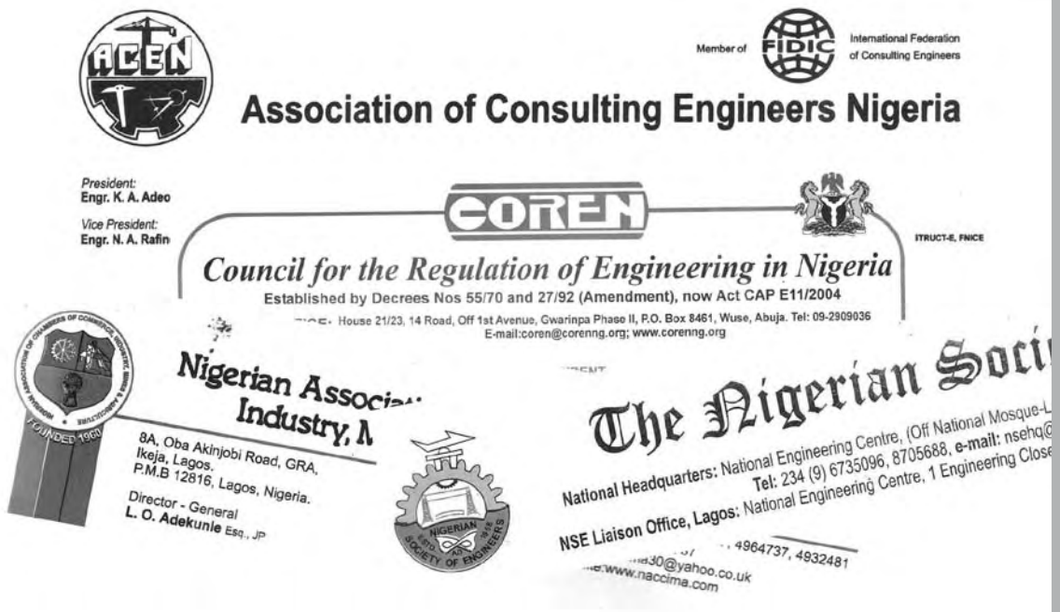
Sovereign Trust Insurance plc commenced business in January 1995 with an authorised share capital of =N=30m and a fully paid-up capital of =N=20m following the acquisition and recapitalisation of Grand Union Assurances Ltd. In December 2006, Sovereign Trust Insurance plc officially listed with a successful rights issue and private placement, also implementing a four-way merger, absorbing Coral Insurance, Confidence Insurance and Prime-trust Insurance. As at the time of its acquisition of ACENICO, its authorised share capital was =N=3.5bn with a fully paid-up capital of =N=1.12bn with ownership made up of 441 shareholders out of which a board of eight directors was constituted.

Post Mortem

The attempt of ACEN members to establish an independent business which started in 1988 thus ended in December 2008 after twenty years. The idea and its actualisation are worthy of commendation. The contributions of Engrs. Adenrele Adejumo, Yemi Songonuga and Debo Adeoye have been mentioned earlier in this chapter. It is, however, important to commend the efforts of Chief S. O. Fadahunsi at the foundation and throughout the life of ACENICO. At formation when capitalisation was needed, Chief Fadahunsi, though not on the ACEN Council, came out strongly in support and paid for ten percent of the shares. On every occasion when additional capital was needed, he not only always took up all his rights issues, he went beyond the call of duty to promote, persuade and encourage others to support ACENICO. He also served as the board chairman for several years.

Hopefully, ACEN will find the will and opportunity to embark on another worthwhile venture in the future. It is therefore pertinent to ask why ACENICO did not succeed so as to avoid such pitfalls in the future. One plausible reason is that most engineers could not afford to invest because of the prevailing economic condition and consequent lack of disposable income. Another is that there was not enough connection between the members of ACEN and the leadership of ACENICO soon after its formation. Why did some of the very senior members of council, especially founding members who were correctly or otherwise perceived to be affluent, not invest? Could the permanency of board seats for some members throughout ACENICO's total period of existence have discouraged investors? Should younger and contemporary engineers have been introduced into the board?

These are questions that must be asked and addressed.



CHAPTER 11

NSE, COREN & OTHER ENGINEERING ASSOCIATIONS IN NIGERIA

Images a - l: Leadership of NSE & COREN

a. Abu Gumel, President COREN 2004 to date
b. Mustapha Bulama, President NSE, 2004-2005
c. Alade Adebola, Vice President NSE, 2008
d. Teju Oyeleye, President NSE 1976-77
e. Kunle Adebajo, Chairman NSE Ikeja Branch 2005-2006
f. O Ajayi, President NSE 1995
g. J Uujamhan, President NSE 1996-97
h. E Osoba, President COREN 2001-03
i. Segun Aderibigbe, NSE Member
j. PB Oyebolu, President NSE 1982-83
k. Kashim Alli, President NSE 2008-2009
l. FA Shonubi, President NSE 1991-92

NSE, COREN & OTHER ENGINEERING ASSOCIATIONS IN NIGERIA

ACEN maintains excellent relationships other engineering associations in Nigeria. The statutory body for the regulation of engineering in Nigeria is COREN, and in this respect, it is the most important engineering body in the country. It regulates the practice of all cadres of engineering personnel in the country. The Nigerian Society of Engineers, NSE, is the oldest and most encompassing engineering society for the graduate engineer with membership in excess of 45,000 engineers. The Academy of Engineers was founded in 2003 by senior engineers to provide recognition and intellectual leadership for the profession. The Oil and Gas Design Engineers of Nigeria, OGDEN, was formed in 2004 and focuses on the oil and gas industry.

Other engineering associations include the Nigerian Association of Technologists, the Nigerian Association of Technicians, and the Nigerian Association of Craftsmen, representing three of the four cadres of engineering practitioners recognised by COREN. The Federation of Construction Industry FOCI represents the interest of indigenous contractors.

A non-engineering organisation with which ACEN is closely involved is the National Chamber of Commerce, Industry, Mines and Agriculture, NACCIMA. This is an umbrella organisation of businesses in Nigeria. Another one is the Manufacturers Association of Nigeria, MAN, but ACEN is not involved with this.

The Nigerian Society of Engineers, NSE

The Nigerian Society of Engineers was founded in the United Kingdom in 1958 by a group of Nigerian engineering students and graduate engineers who felt that there was a need for a Nigerian voice in the development of engineering in their country. It was inaugurated on the 16th of February in London and Mr. G. O. Aiwerioba was elected president. Other officers elected at the London meeting were Teju Oyeleye as general secretary, E. N. Ojukwu as treasurer, A. O. Madedor as assistant secretary, E. R. Akpan as technical secretary, M. Okoro as publicity secretary, and A. S. Umenyi, A. O. Adekola and J. O. Edega as unofficial members of the executive.

Aiwerioba had his initial training in engineering at the PWD Technical School, Lagos before proceeding to the United Kingdom in 1952. He graduated as a civil engineer in 1955 and served his pupilage at Sir Frederick S. Snow and Partners. Sir Snow was then a member of the council of British Institution of Civil Engineers. He evaluated Aiwerioba's pre-university practical experience and considered it adequate to qualify him for registration and sponsored him. He passed his interview and was admitted to the Institute.

The formal incorporation of NSE in Nigeria took place in Abeokuta on the 19th of January 1959 and G. O. Aiwerioba continued to be instrumental in the evolving Association. He was recalled to Nigeria partly on account of his role in the formation of NSE which his expatriate employers frowned upon and posted to Abeokuta. There he continued to mobilise engineers to the cause of NSE and eventually, with him as protem secretary and S. O. Fadahunsi as protem chairman, they organised the local inaugural meeting of NSE in Nigeria. Chief Adeniyi Williams, though unable to attend this meeting, was elected president. There were two vice presidents, S. O. Williams and S. O. Fadahunsi. Aiwerioba was confirmed general secretary and Dr, Ademola Banjo technical secretary. V. O. Atuanya, I. Osili and J. Olaniyan were elected treasurer, assistant secretary and publicity secretary respectively. The Society was later incorporated as a company limited by guarantee and not having a share capital in 1967.

NSE is the national umbrella organisation for the engineering profession in the country. According to its website,

> *"the objective of the Society is to promote the advancement of engineering education, research, and practice in all its ramifications, with a view to maintaining and enhancing the professional capabilities of its members so as to better equip them to fulfil the needs of the profession for the good of the public and the nation at large."*

The objectives set out by NSE for itself are very broad and include responsibilities to the engineering profession, to local, state and federal government on all engineering matters, to the general public to educate and protect them, to educational institutions on engineering education, to its members on professional and ethical practice, and much more.

It has four categories of membership: students, graduates, corporate members and fellows. NSE does not represent firms or businesses. The fields of practice in which its members are found is very broad and varied and include the academia, consulting engineering practice, contracting, manufacturing, civil service, research and development and engineering sales and marketing. Its basic admission requirement is a

university degree with at least two years of supervised apprenticeship. Holders of the Higher National Diploma qualification are required to pass a qualifying examination of the society or do an approved post-graduate course before admission.

NSE's strongest role today is as the voice and the face of the engineer to the government and the general public, often eclipsing the statutory body, COREN. It liaises with the federal government on engineering matters and is frequently invited to give opinions and advice on topical issues as well as to nominate members to boards and other important committees and task forces of government.

Right from the time of the establishment of COREN, NSE was conceived to play a critical role in the Council. Apart from senior civil servants, perhaps the only organisation that was consulted by the then Commissioner for Works, Mr. Femi Okunnu was the leadership of NSE, who gave their support and approval. The COREN decree recognised NSE's importance and provided for six members of the Society to serve on the Council. Four of NSE past presidents, Fadahunsi, Faluyi, Inuwa and Gumel have gone on to become presidents of COREN. The Society cooperates almost seamlessly with the Council.

The strength of NSE is that it is loved and identified with by most engineers. Its membership is large and can be found everywhere in the country and in all engineering disciplines.

The highest policy making body of the society is its Council, which is elected by its corporate members and headed by a president. The Society has a secretariat currently housed at the National Engineering Centre, Labour House Road, Central Business Area, Abuja, a building owned by the Society. A full time Executive Secretary heads the secretariat and is responsible for the day to day activities and administration.

The Council delegates the operational end of its governance and policy responsibilities to be managed by a fourteen-man Executive Committee, eleven of whom are elected at the Annual General Meetings. The elected officers include the deputy president, three vice presidents and six executive committee members. The deputy president is elected from among the vice presidents for a two-year term after which he automatically becomes the president. The executive secretary and immediate past presidents make up the rest of the fourteen-man committee. Election to the position of deputy president is keen and competitive, as the deputy president automatically becomes the president without any further elections.

The membership at large is organised along Divisions and Branches. A division is a subgroup with specific professional interest. As at 2008, sixteen divisions listed in Table 12 were in active existence. Two divisions are, however, specific interest groups rather than professional groupings. One is the Association of Professional Women Engineers, APWEN, which represents the particular interests of women in engineering. The other is the Board of Fellows which has responsibility for the admission, regulation and management of the affairs of the 'Fellows' category of members. Fellows of the Association are very senior and experienced engineers who are considered to have made significant contributions to engineering and who are either invited or apply to join the rank of Fellows. Their qualifications, experience and contributions to the engineering profession are evaluated and those considered deserving are recommended to the Council for election as Fellows. Some divisions were created from within NSE while others were independently created and subsequently absorbed as divisions. Branches are located geographically, mostly in towns and cities with the critical number of engineers within the vicinity. Large cities like Lagos have more than one branch. As at 2008, there were 51 branches. Representatives of divisions and branches serve on the Council of the society.

Table 11 Branches of NSE

1. Aba
2. Abakaliki
3. Abeokuta
4. Abuja
5. Ado-Ekiti
6. Ajaokuta
7. Akure
8. Apapa
9. Asaba
10. Awka
11. Bauchi
12. Benin
13. Calabar
14. Damaturu
15. Dutse
16. Egbin
17. Eket
18. Ekpoma
19. Enugu
20. Gombe
21. Gusau
22. Ibadan
23. Ikeja
24. Ikot Abasi
25. Ile-ife
26. Ilesha
27. Ilorin
28. Jos
29. Kaduna
30. Kano
31. Katsina
32. Lafia
33. Lagos
34. Lokoja
35. Maiduguri
36. Makurdi
37. Minna
38. New Bussa
39. Nsukka
40. Onitsha
41. Osogbo
42. Owerri
43. Port Harcourt
44. Sokoto
45. Umuahia
46. Uyo
47. Victoria Island
48. Warri
49. Yenogoa
50. Yola
51. Zaria

Table 12 Divisions of NSE

1. Aeronautical
2. APWEN
3. Board of Fellows
4. Civil
5. Electrical
6. Environmental
7. Geo-Technical
8. Industrial
9. Marine Engineer & Naval Architecture
10. Mechanical
11. Metallurgy & Mining
12. N.I.A.E
13. N.I Struct. E.
14. NSChE
15. Petroleum & Gas
16. Institute of Appraisers & Cost Engineers

NSE also invites specialist interests groups to serve on its Council. These are usually groups with strong engineering interest but which are too established to be absorbed as divisions. As at 2008, there were eleven such organisations listed Table 13 serving on NSE Council. This allows the critical input into the Council's deliberations that would otherwise not have been present. ACEN and COREN are in this category which also includes the National Assembly and the Ministries of Works and Transport.

Table 13 Special Interest Groups on NSE Council

1. Committee of Deans of Engineering & Technology (CODET)
2. Committee of Heads of Polytechnic and College of Technology (COHEAD)
3. President, ACEN
4. President, COREN
5. Registrar, COREN
6. Secretary General, FAOE
7. Manufacturers Association of Nigeria, MAN
8. Representative of FOCI (formerly FOBACEC)
9. Ministry of Works
10. National Assembly
11. Ministry of Transportation

Past presidents of NSE are permanent members of Council. Their commitment, experience and seniority in the profession and society bring much richness and value to the deliberations of council and running of the Society. Their participation remains one of the greatest assets of the Society.

NSE and National Integration

NSE is, however, much more than a professional association. It has provided a veritable platform for national integration and social networking among its members. Members from different parts of the country, tribes, religion and disciplines meet on the platform of engineering and become friends and colleagues and develop life-time relationships. The civil war, for example, was as traumatic to the Society as it was to the nation. Made up of a sizeable number of Igbos, the Society lost key officers like the secretary-general Charles Nwariaku and the president J.C. Egbuna. Several other Igbo engineers left, many of them later to form the engineering corps of the Biafran army where they played notable roles in the war efforts. A report of the NSE later paid tribute to "Dr M.S.C. Nwariaku who, undaunted by the danger of the time, worked until the last moment with the 1st vice-president, Engr. S.O. Fadahunsi, who took over the mantle of president". The numerical strength of the society suffered serious decline. Whereas there were about 40 engineers at the formal founding of the NSE on 16th February 1959, and attendance at the Annual General Meetings had hitherto shown a steady rise to over 100 members in 1964, this trend was immediately reversed. By 1968, only 47 members attended the AGM held in December.

Frequently, what constitute the strengths of an organisation can become its weaknesses. With a Council consisting of fourteen executive committee members, seventeen divisions, fifty one branches, eleven special interests and about twenty past presidents all totalling over a hundred, the Council has indeed become very large and perhaps unwieldy. Meaningful debates at Council meeting have become difficult giving the number of participants and time available. Trying to represent about twenty professional disciplines (the basis for the divisions) and trade groups (partly the basis for the special interest groups) can indeed be very challenging as these interests are sometimes conflicting. An individual NSE member invariably belongs to a branch by virtue of his location, to one or two divisions by virtue of his disciplines, one trade group by virtue of his livelihood, and yet another one if a fellow (and another still if female). All these sub-groups and the centre demand subscriptions and participation and often have similar programmes of training and annual conferences. Invariably, he identifies with only

one or two and ignores all the others. In the recent past, the Society has tried to gravitate towards a unitary form of administration with a very strong centre and weaker divisions and branches. The resultant effect is that NSE is now perhaps less articulate than it needs to be, and consequently less effective.

According to past president Dr. F. A. Shonubi, the leadership of NSE had identified these challenges a long time ago and while Engr. Ife Akintunde was president, a committee to look at NSE thirty years ahead had been set up. The committee had recommended that the society should proceed more in the direction of a federation of divisions with less emphasis on branches; that branches should be aggregated to regional levels using geo-political zoning or other criteria. This is one area NSE needs to urgently address critically.

Relationship between ACEN and NSE

While ACEN fully recognises COREN as the regulatory body for the engineering profession in Nigeria, and NSE as the umbrella body of engineers, working relationship between ACEN and NSE was not always very clear. Most engineers in Nigeria are members of the Nigerian Society of Engineers, as this was the primary association of the profession. Virtually all members of ACEN are indeed members of NSE, and several of them play very active roles and some go on to hold elective posts including becoming presidents of the Society. Even at formation, one of the founding members of ACEN, Engr Obi Obembe, had just ended his tenure as NSE president while Dr. F. A. Shonubi had been a past secretary.

At some point, however, there seemed to have been an undercurrent of competition between these two associations. Dr. F. A. Shonubi threw some insight into the probable causes of this. Before the formation of NSE, the West Africa Joint Group of Engineers, WAJGE, had been formed by the members of the British institutions. The members of this group consisted mostly of expatriates and senior engineers. The NSE, on the other hand, was formed by younger engineers with a patriotic zeal. There was, therefore, a seeming confrontation of establishment (WAJGE) and youthfulness (NSE). Some of the WAJGE members resented NSE and did not join the new Association for a long time, but joined ACEN. This might have affected the perceptions of the leaders of both organisations.

The second possibility is that some in NSE felt that ACEN was not necessary. In response to the specific needs of consulting engineers, the NSE had set up the Professional Practice Committee. However, membership of this committee was a mix of full and part time consultants and other engineers who were not consultants. ACEN members felt that such a committee would not understand the issues sufficiently or give the desired attention and commitment as those whose livelihood totally depended on the sector. When this argument was eventually accepted, some members of NSE still felt that ACEN should indeed be a division of NSE and not be fully independent of it as it was set out to be. Eventually NSE accepted ACEN fully and the Professional Practice Committee was discontinued. As with most arguments, some bruises might have been left.

In spite of this seeming competition, both associations cooperate fully at all times on engineering matters. Indeed, one of the first major acts of ACEN was the preparation of the Conditions of Engagement and Scale of Fees for consulting engineering practice in Nigeria. NSE fully recognised and endorsed this effort. In its newsletter announcing its approval of this document, it stated as follows:

> *Conditions of Engagement and Scale of Fees as approved by the Nigerian Society of Engineers were published in April 1973 and carried the following foreword:*
>
> *"The Association of Consulting Engineers was formed with the object of promoting the advancement of the profession of consulting engineering and of providing facilities for government, public bodies, associations representing industry and trade, and others to confer with consulting engineers as a body and ascertain their collective views. The association is a medium through which the public can be informed as to the standing, experience and qualifications of its members. If any person requires professional advice and assistance and is in doubt as to whom to approach, the association is always willing to nominate one or more of its members specially qualified for the purpose.*
>
> *Members of the Association of Consulting Engineers are governed by the Articles of Association which incorporate rules for professional conduct. Members must have had many years of experience in the design and supervision of important engineering works. Members*

of the Association are not allowed to have any connection with commercial, manufacturing or contracting interests, such as would tend to influence their professional judgment in matters upon which they advise, or to receive any enumeration for their services other than from their clients."

Since this early period of formation, the relationship has only waxed stronger and the two associations are well blended. ACEN continues to see itself as a subset of the larger engineering family with specific focus on consulting engineering. NSE remains the umbrella association of all engineers with a much broader scope of membership and responsibilities. ACEN members individually play their full roles as NSE members.

COREN

COREN was first established by Decree 55 of 1970 as the Council for the Registration of Engineers in Nigeria when Mr. Femi Okunnu was the Commissioner for Works and Housing. The formation of COREN was then delayed by two factors. The first was the protest by the Nigerian Society of Chemical Engineers that they did not consider the NSE as adequate to represent the interests of their members. The second was the lobby by other stakeholders, mainly expatriate engineers, that the decree would lead to massive exodus of foreign engineers and that Nigeria would not be able to cope, and their ability to persuade the leadership of government on this.

These two challenges have been in a way fundamental to the engineering profession and remain with us today. These are: dissent among engineers themselves; and interests of other stakeholders. The number of disciplines in the profession is very large and continues to increase. Whereas in other sectors of the economy, they are classified as different professions, this is not so in engineering. For example, medicine, pharmacy, physiotherapy, and nursing are classified as different professions in the health care sector. Similarly, accounting, economics and finance are considered different professions in the finance industry. In engineering, all related disciplines tend to be classified as engineering. There are a few exceptions such as the building sub-sector where we have architects and quantity surveyors. This diversity within the unified engineering profession often leads to misunderstanding that hurts the profession. The argument above that NSE should perhaps be strengthened along disciplines is one of the consequences of this diversity. The diversity along business lines is much narrower and has been largely resolved. Core engineering businesses include consulting, contracting, manufacturing, maintenance, mining and perhaps a few others. The academics and government-employed engineers are primarily lecturers and civil servants. However, the interests of engineers in the civil service are often in conflict with those in practice.

The second challenge, the particular interests of other stakeholders in the engineering industry, is much more difficult to resolve as policies and institutional frameworks are required to address them. There are many stakeholders, including politicians, who want infrastructures for their constituencies and funding for their parties, civil servants who want control of the industry, foreign governments who want shares of the local business, international financial institutions who want regulation and standardisation, and multi-nationals companies who set impossible standards, and the local players who want active roles in their country's development.

The main consideration from the nation's point of view should be national development and the strategic use of engineering for this purpose. Without the national leadership recognising the distinct and peculiar role of engineering in national development, the right policies will not be made. Developed countries understand and appreciate this peculiar role of engineering to their national development. They, therefore enact laws and regulations that control the practice of engineering in their own countries, and sometimes within states and regions in the same country. When it comes to international practice, however, they want unbridled access to developing countries without any reciprocity. A major factor is the large amounts of money spent on engineering infrastructures. This makes engineering projects attractive areas for greed and corruption to thrive.

These two issues still remain the major challenges of the profession till today.

As the name implies, the enabling decree in 1970 only empowered the Council to register and control the practice of engineers and did not include all other professionals in the engineering industry. This created a lot of challenges for both the Council and the industry. The Council stipulated a minimum of university bachelor's decree for

registration as engineers, just as NSE had done for its membership. Other technical professionals in the industry were not catered for. The holders of the HND, in particular, felt strongly aggrieved by not being able to register with either NSE or COREN. In 1976, they sought to form their own association, the Nigerian Institute of Technological Engineers, NITE. Both NSE and COREN strongly objected to this and prevented its registration on the grounds that an institute was necessarily educational, and all aspects of engineering were already included under the COREN Decree. The level of disenchantment was very high and some undercurrent of it still remains till today. Other cadres of the engineering profession, including technicians and tradesmen, were also left out of the provisions of the Decree.

These and other developments necessitated the revision of the Decree. Under the presidency of General Ibrahim Babangida, on the 26th day of June 1992, a new decree was promulgated as Decree No. 27 of 1992, which amended Decree 55 of 1970. By this amendment, the powers of COREN were extended to cover the practices of all cadres of engineering personnel, that is, engineers, technologists, technicians, craftsmen and engineering consulting firms in Nigeria, bringing all the cadres together as the 'Engineering Family' under one regulatory umbrella, COREN. With this, while retaining the acronym COREN, the name was changed to Council for the Regulation of Engineering in Nigeria.

COREN is therefore a statutory organ of the Federal Government established by Decree No. 55 of 1970, as amended by Decree 27 of 1992, which is empowered to control and regulate the practice of the engineering profession in all its aspects and ramifications in Nigeria. At the advent of the democratically elected government, the Decree became an act.

The major activities carried out by COREN are as follows:

1. Registration of Engineering Personnel and Consulting Firms
Holders of appropriate qualifications from accredited engineering programmes offered by Nigerian or foreign institutions, after obtaining the necessary post-graduation practical experience of at least four years may be registered as follows if they are successful in the professional interview/examination:

- Engineers - degree holders or mature candidates whose Higher National Diplomas were obtained before 1982, are at least 45 years old and have more than 15 years experience.

- Engineering Technologists - holders of Higher National Diploma (HND)

- Engineering Technicians - holders of Ordinary National Diploma or Full Technological Certificate.

- Engineering Craftsmen - holders of Technical College Certificate of Trade Test 1 Certificate with 10 years experience.

- Consulting Firms are registrable if their principal partners are registered engineers with at least 10 years experience and the company is registered with the Corporate Affairs Commission.

2. Supervised Industrial Training Scheme in Engineering (SITSIE)
This programme for degree and HND holders in engineering starts during their National Youth Service Year and lasts for two years. A graduate is posted by the NYSC directorate to an engineering establishment and remains with the same establishment for the next year after the NYSC programme, being supervised during the two years by supervisors appointed by COREN and the establishment.

3. Engineering Regulations Monitoring (ERM)
COREN ensures through this programme, operated for it by inspectors appointed from experienced registered engineers who are corporate members or fellows of Nigerian Society of Engineers, that only registered engineering personnel engage in or are engaged for engineering work. Regulations established for the practice of engineering and progressions of engineering personnel are monitored and violators are prosecuted.

4. Engineering Assembly
A yearly Engineering Assembly, which brings together all members of the engineering Family - Engineers, Technologists, Technicians, Craftsman - is organized in different parts of the country. Topical issues in engineering and technology are the themes of the Assembly.

5. Accreditation of Engineering Programmes in Universities, Polytechnics and Technical Colleges.
A major aspect of COREN responsibility is the inspection of facilities

and faculty and accreditation of institutions providing engineering training. This evaluation is usually done at inception and at regular periods to ensure that the standards are maintained. As at 31st October 2008, 28 universities listed in Table 5 were accredited to provide degree training in Nigeria by the Council.

6. Continuing Professional Development (CPD)
COREN will begin to require CPD units in order to license practicing engineering personnel annually. The CPD units are acquired by engaging in research, attending conferences and workshops, publishing papers in journals and presenting papers at conferences.

COREN is run by a 23-member Council headed by a chairman and a vice chairman, who are elected from among its members. Its day to day affairs and administration are managed by a full time Registrar. In its thirty eight years of existence, the Council has had eight presidents, nine vice presidents and eight registrars.

The composition of the Council is contained in the act and is made up as follows:

a. One person who shall be elected by the Council as the president;
b. Six persons elected to represent the Nigerian Society of Engineers in the manner provided by the constitution of the society;
c. Four persons appointed to represent the universities with faculties of engineering in rotation;
d. One person appointed to represent the polytechnics in rotation;
e. One person appointed to represent technical colleges in rotation;
f. Six persons appointed to represent the states of the federation in rotation;
g. Four persons to be nominated by the minister; and
h. One person each to represent each of the following cadres to be appointed from their respective registers, that is-
    i. Registered engineering technologists,
    ii. Registered engineering technicians,
    iii. Registered engineering craftsmen.

According to section 3 of the Act, however, the Council is under the direction of the Minister of Works who is empowered as follows:

1.The Minister may give to the Council directions of a general character or relating generally to particular matters (but not to any individual person or case) with regard to the exercise by the Council of its functions and it shall be the duty of the Council to comply with the directions.

2. Before giving a direction under the foregoing subsection, the Minister shall serve a copy of the proposed direction on the Council and shall afford the Council an opportunity of making representations to him with respect to the direction, and after considering any representations made to him in pursuance of this subsection, the Minister may give the direction either without modification, or with such modifications as appear to him to be appropriate having regard to the representations.

3. In pursuance of the provisions of subsections (1) and (2) of this section, the Minister shall, subject to the approval of the National Council of Ministers, give necessary inducement to private industries providing adequate training facilities to engineers, engineering technologists, technicians and craftsmen in training.

This section in a way undermines much of the powers of the Council and places the overall authority of the regulation of engineering in Nigeria in the hands of one person, the minister, and the Council mainly carrying out his directives. In the situation where the minister has no experience of the engineering industry, this can indeed be counterproductive.

With specific reference to consulting engineering, Section 7B: Registration of Consultants provides as follows:

1. The Council shall register annually all organizations performing engineering consultancy services.

2. No firm or partnership shall practice as engineers in Nigeria unless it is registered by the Council.

3. The Council may from time to time, make regulations controlling the practice of engineering in the construction industry, including regulations as to the full-time or part-time use of persons registered with the Council.

Provided that the Council shall not be involved in the registration of contractors.

In response to this clause, the Council registers consultancy firms in the following categories complying with the appropriate conditions of registration listed below:

Sole-Ownership

a. This can be owned by a COREN-registered engineer who must be up-to-date in the payment of his practicing fee.
b. The firm must be registered by the Corporate Affairs Commission with a Certificate of Registration.
c. (c)Corporate Affairs Form 2 (form of application for registration)
d. Brochure of the firm must be submitted with the COREN firm form.
e. CV of owner.

Partnership

a. To be owned by two or more registered engineers who must be up-to-date in the payment of their practicing fees.
b. Registered with the Corporate Affairs Commission with a Certificate of Incorporation.
c. Corporate Affairs Commission Form 2 (form of application for registration).
d. Brochure of the firm
e. CV of partners.

Limited Liability

a. Directors on the board who are registered engineers must be shareholders of the firms and hold at least 55% share.
b. Registered with the Corporate Affairs Commission with a Certificate of Incorporation.
c. Brochure of the firm
d. Corporate Affairs form C0 2
e. Corporate Affairs form C0 7
f. C V of Partners/Directors

The Council also maintains a register of Engineering Consulting Firms.

ACEN & COREN

A major grouse of ACEN is its lack of representation on COREN Council. At the time of its formation in 1970, ACEN was not in existence, and could therefore not have been listed as a member. By the time of the revision of the decree in 1992, however, ACEN was firmly established and lobbied to be so included without success. NSE, however, agreed to cede one of its six seats on the Council to ACEN in recognition of the importance of ACEN in regulating engineering affairs in the country. Implementation of this commitment has not been regular, and only two ACEN representatives, Lanre Sagaya and Edet Amana, have been able to sit on COREN Council as ACEN presidents. In the 1992 amendment, COREN was given the additional responsibility to manage consulting engineering practice in Nigeria. In discharging this responsibility, COREN adopted the practice of inviting ACEN to nominate the chairman of the committee to register consultants. Even this practice has not been consistently followed.

All the same, ACEN continues to maintain very cooperative and cordial relationship with COREN and its leadership. COREN always invites ACEN to participate in its activities and supports ACEN activities. The registration of consulting engineers is one area in which the cooperation is best noticed. COREN now demands that all consulting engineers register with ACEN as part of the condition for maintaining their registrations. The certification of ACEN workshop for Continuing Professional Development has also been agreed and is being developed.

Academy of Engineering

The Academy of Engineering was inspired by the need felt by some senior engineers for a small, focused engineering body. It would have the narrower objects of the advancement and pursuit of excellence in engineering, and the provision of a national platform or source of competent and mature input into public and private technical policy. The idea was further encouraged by the existence of similar academies in a number of countries such as the United Kingdom, Canada, India, the United States of America, Russia and Egypt.

The objects for which the Academy is established are:

1. To promote excellence in, and general advancement of engineering science, practice and technology and related disciplines, and

2. To facilitate dissemination and exchange of ideas among members and other similar bodies and establishments, specifically

a. to organise ways of anticipating and assessing the changing needs of Nigeria and to advise appropriate bodies on the technical resources that should be applied and to sponsor programmes aimed at meeting these needs;

b. to provide independent and expert advice on matters of national importance pertinent to engineering and technology;

c. to cooperate and interact with professional bodies, engineering and scientific academies, locally and internationally;

d. to recognise engineering achievements and outstanding contributions to society and country by Nigerian Engineers (and engineering scientists);

e. to provide a forum for Nigerian engineers to report on research and development activities in engineering;

f. to apply or petition for any legislation, parliamentary or otherwise that would further any of the objects of the Academy.

The Academy was incorporated in September 1997 as a private company limited by guarantee. The signatories to the original article and memorandum of the association include Engr. A.O. Faluyi, Engr. (Prof) 1.O. Oladapo, Engr. (Prof) R.I. Salawu and Engr. V.I. Maduka. The governing body is a 15-man council which consists of the president, vice president, honorary secretary, honorary treasurer and technical secretary, two last presidents and eight other fellows elected by the Annual General Meeting. The vice president automatically succeeds the president at the end of the latter's two-year tenure, and election is by secret ballot.

The founding fellows of the academy comprised of thirty four very senior engineers, including Engrs. T. M. Aluko, E. J. Amana, E. I. I. Etteh, S. O. Fadahunsi, P. B. Oyebolu and F. A. Shonubi from the consulting industry. The founding president was Engr. Prof. I. O. Oladapo. As at 2009, the society has about eighty members.

OGDEN

OGDEN is the acronym for the Oil and Gas Design Engineers of Nigeria. The Executive Secretary of the organisation, Dr. Lola Amao, provided the following information on the organisation:

> A proactive initiative to further the Federal Government of Nigeria's drive for increased local participation in the Nigerian Oil and Gas industry has evolved in the form of an association of Engineering Design Companies. The Oil and Gas Design Engineers of Nigeria (OGDEN) was inaugurated on Thursday, 5th February, 2004. Members of this association are committed to ensuring that all FEED and detailed Engineering Oil and Gas projects are executed and successfully completed "in-country".
>
> OGDEN is a collaborative vehicle with the aim of ensuring that Engineering Projects are executed in Nigeria by qualified companies (Local and Foreign with appropriate expertise). The Transfer of Technology to locals and building up of "in-country" capacity is fundamental to the success of job and wealth creation in the Nigerian Oil and Gas industry.
>
> The association's primary functions are:
>
> 1. To facilitate the implementation of the Nigerian Local Content Policy, as it relates to Engineering Design, for the creation of employment and wealth in Nigeria.
>
> 2. Facilitation of Local Capacity building to world class standard
>
> The main criteria for membership shall be Nigerian engineering companies or engineering companies with Nigerian share holding who are truly committed to the development of the local industry to world-class level.
>
> OGDEN is integrated in to the Oil and Gas industry through a

framework of four divisions namely:

1. Technology Development Centre (TDC)
2. Consortium management (CM)
3. Industry and Government Relations (I&GR)
4. Finance and Planning (F&P)

The executives of OGDEN are: President, Engr. Alex Ogedegbe Former. GED, Engineering and Technical (E&T) NNPC, now, Principal Consultant of MacMorgan Engineering ltd., Vice President, Engr. B. A. Soyode of Atlas Polygenics Engineering and the Executive Secretary, Dr. Lola Amao, Principal Consultant, Lonadek Oil and Gas Consultants,

Advocacy Successes

1. Establishment of a Nigerian Content Division of NNPC

2. Domiciliation of all FEED and Detailed Engineering projects as from 1st January 2006, through a Nigerian Content Directive issued by NNPC-NCD Division under the tenure of Engr Funsho Kupolukun as the GMD and Engr. J.A. Akande as the GGM,NCD.

3. Successful completion of Nigerian Content workscope on the Chevron Agbami FPSO project. Execution of 300,000 man-hours of Engineering workscope (Engineering and Training assignments in KBR, Houston Office and DSME, Okpo Ship Yard) by a consortium of 16 companies with NETCO as the consortium leader.

Through OGDEN, indigenous engineering companies have been able to work together in the execution of several projects with international partners. An example is the Agbami FPSO project for Chevron, and USAN FPSO project for Total Fina Elf to mention just two. These projects gave Nigerians the opportunities to work side by side with the international companies in their offices abroad and gain experience. For this project, Nigerians were seconded to KBR (Kellog Brown Root) offices in Houston, Daewoo offices in Korea and NETCO's offices here in Nigeria. The three hundred thousand man hours will be the total man hours for Nigerian content from these locations.

ACEN believes that opportunity for cooperation with OGDEN and collaboration with its members should be fully encouraged. Some members of ACEN have already joined OGDEN. This should promote collaborations among the member firms and the two associations.

Nigerian Association of Engineering Craftsmen

The Nigerian Association of Engineering Craftsmen is a professional body for the craftsmen cadre. It was established after the amendment of decree 55/70 by decree 27/92 which empowered COREN to register all cadres of the engineering family. The Association was established in 1992 and inaugurated in 1993.

The objective of the Association is to bring together all engineering personnel within this cadre to promote quality and professionalism in engineering practice in Nigeria.

Its aims and objectives are as follows:

1. To advance the theory and practice of engineering in all the fields of Engineering Crafts

2. To afford a means for facilitating the acquisition and preservation of the knowledge which pertains to the professional therewith:

3. To represent section in the Council for the Regulation of Engineering in Nigeria (COREN) and other related professional bodies where applicable locally and internationally

4. To represent to any Government the views of the Association on any legislative enactment or proposed legislation on any subject's concern or interest to the Association in Nigeria.

5. To maintain high standards of professional practices in engineering and related industries and ascertain high academic and professional standards in all the related programmes in technical/vocational schools in Nigeria.

NACCIMA

The Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture, NACCIMA, is the umbrella organization for all the city/state and Bilateral Chambers of Commerce within the Federal Republic of Nigeria. According to their website,

Since its inception, NACCIMA has grown into a colossus and acquired significance within and outside the country. It has become the most effective and efficient organ through which the Nigerian business class influences government on a wide range of issues affecting Commerce and Industry. During the military era, the Association was at the vanguard of the struggle for restoration of democracy in the country.

In order to take advantage of the opportunities which the new democratic dispensation offers, NACCIMA upgraded its Business Information Centre to Trade and Investment Promotion Centre to provide prospective investors with the latest information on the variety of investment opportunities in Nigeria. Since it was established, the Centre has hosted numerous foreign business and economic delegations and arranged trade missions to foreign countries.

Objectives
The primary objective of the Association is to create a conducive atmosphere for the pursuit of commerce, industry and all other forms of economic activities of interest to the private sector. Other objectives include:

- To promote, protect and develop all matters affecting business
- To encourage an orderly expansion and development of all segments of the community
- To contribute to the overall economic stability of the community
- To encourage and promote the nations private sector
- To provide a network of national and international business contacts and opportunities
- Carry out training programmes for members and other relevant economic agents
- Create business services and information and attract inflow of investments and tourists
- Advocating for better business environment and creating new opportunities and industries

Functions of NACCIMA

a. Collection and dissemination of vital business information.

b. Monitoring the performance of the economy and making representation to Government and its agencies with regard to the effects of various economic, fiscal and monetary measures.

c. Identification of obstacles to the establishment and profitable operations of commercial, industrial and other enterprises, especially those arising from government policies or the administration of such policies and the exertion of pressure for the removal of such obstacles.

d. Organizing seminars and workshops on various aspects of the economy, business and management.

e. Promoting commercial, industrial and in general economic cooperation between Nigeria and other countries.

f. Assisting to protect Nigeria's image and business interests abroad by mediating in commercial disputes.

ACEN and NACCIMA
ACEN joined NACCIMA formally in 2000 when Engr. M. O. Adesina was president. Engr. Adesina had been very active in both NACCIMA and ACEN over several years and sought to take advantage of the potential synergy between the two organisations. He brought a motion to the Council of ACEN, which was approved and ACEN formally joined NACCIMA.

a

b

c

CHAPTER 12

FIDIC & INTERNATIONAL ACTIVITIES

Image Opposite

a. FIDIC Annual Conference, Rio de Janeiro, 1984
b. FIDIC Executive Committee, 2007
c. Participants at GAMA Conference, Kampala, Uganda, 2005

Image Above: Flags of Nations. Source iStock

Relationship with FIDIC, Fédération Internationale des Ingénieurs-Conseils, has been an integral part of ACEN activities right from its formation. The correspondences shown in figures 1-5 indicate that F. A. O. Phillips and the members of the newly formed Nigerian association must have met with the then president of FIDIC, W. W. Moore in Lagos in 1971, and the new association discussed. It is not clear why Bill Moore was visiting Nigeria, but he was the principal partner of a consulting engineering firm, Dave and Moore, with an office in Nigeria at the time. Subsequently, Mr. Moore wrote first letter on the 4th of January 1972 encouraging the formation of the Association and enclosing drafts of the Articles of Incorporation and Bye-Laws of the Consulting Engineering Council of the United State of America, with a promise to send those of the ACE (UK) and the Malaysian Association. These were later sent by the then FIDIC Executive Secretary, H. Hillebrand. Following on the heel of this first letter, ACEN was invited to attend the FIDIC conference to be held in Stockholm, Sweden in June 1972. Although there are no confirmatory evidence, this was probably the first FIDIC meeting to be attended by ACEN members. These correspondences clearly establish ACEN's relationship with FIDIC since 1972, a period of over 37 years.

The first opportunity for ACEN to be admitted to FIDIC presented itself in 1974. The Secretary General of FIDIC, Mr. Frijlink, had proposed that Nigeria should apply for full membership and be presented for admission at the 1974 conference scheduled for Cape Town, South Africa. Nigeria had to decline this offer as it was then politically impossible for the Nigerian delegation to visit South Africa at the time as South Africa still operated the Apartheid policy. Nigeria therefore did not attend the 1974 conference, but attended the 1975 conference in Paris.

Eventually, by a letter dated 10th May, 1976, Nigeria formally applied for the membership of FIDIC. The application included the Memorandum and Articles of Association of ACEN as well as the list of the 47 members of the Association at the time. It is interesting to note that the Association had two names in this letter. The letterhead had 'Association of Consulting Engineers of Nigeria' while the body of the letter had 'Association of Consulting Engineers Nigeria'. A third version, 'Association of Consulting Engineers (Nigeria)' was used in some other correspondences with FIDIC.

A reply to the application, dated 21st February 1977 was sent by Mr. Hillebrand informing ACEN that the Executive Committee had approved the application and that they would be admitted at the forth-coming conference in Helsinki, Finland. ACEN promptly responded and nominated the President and the Honorary Secretary, V. O. Oyefodunrin to attend the General Assembly Meeting, GAM. Nigeria was presented to GAM along with Hong Kong and Portugal and they were all admitted as members of FIDIC on the 8th of June 1977. The new FIDIC president, Mr. H. F. Buchi, sent a letter of congratulations.

At the time of the admission of ACEN into FIDIC, there were three other African countries in the organisation, South Africa, Zimbabwe and Kenya.

FIDIC was formed in Belgium in 1913 and had an initial membership of 11 countries. Today, FIDIC is the voice of consulting engineering business in the world with the following membership characteristics:

- 80 National Member Associations
- 28,000 Consulting Firms in these associations
- 1,000,000 Staff employed by the firms
- US$ 100 billion in annual fees for services
- US$ 1,500 billion in annual construction costs

The mission of FIDIC is:
To promote the business interests of members providing technology-based intellectual services for the built and natural environment, and while doing so, accept and uphold our responsibilities to society

FIDIC has seven key focus areas as follows:

Key objectives
Representation
FIDIC tries to represent the consulting engineering industry in the world. This it does by deliberately attracting member associations in all countries. Today, there are about 80 Member Associations in FIDIC, distributed across geographical, ideological and development zones. All the three countries in North America are members, as well as all the 27 countries in the European Union. Out of the 53 countries in Africa, only 14 are members. Asia and Pacific Region have 15, inclusive of all the big economies of the region. The weakest link in the FIDIC family is South

Fig i. First official communication from FIDIC President Bill Moore January 1972

FIDIC

FEDERATION INTERNATIONALE DES INGENIEURS-CONSEILS
INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS
INTERNATIONALE VEREINIGUNG BERATENDER INGENIEURE

Registered in Zurich (Switzerland) - Constituted 1913

AFFILIATED ASSOCIATIONS IN:

Australia	*Germany*	*The Netherlands*
Belgium	*Great Britain*	*Norway*
Canada	*Iceland*	*Rhodesia*
Colombia	*Ireland*	*South Africa*
Denmark	*Italy*	*Sweden*
Finland	*Luxemburg*	*Switzerland*
France	*Malawi*	*USA*

January 4, 1972

FROM THE OFFICE OF:

The President
500 Sansome Street
San Francisco, California 94111
U.S.A.

RECEIVED
7 JAN 1972
FIDIC SECRETARIAT
COPY TO: HCF

Mr. Foluseke A. O. Phillips
F.A.O. Phillips & Associates
22, Ogunlana Drive
Surulere
Lagos, Nigeria

Dear Mr. Phillips:

I was very pleased to have the opportunity of meeting with you and other members of your newly formed Association of Consulting Engineers of Nigeria when I was in Lagos a couple of months ago.

In accordance with our discussions in Lagos, I am enclosing a copy of the Articles of Incorporation and Bylaws of the Consulting Engineers Council/USA. This document is probably longer and more complicated than you may find appropriate for your immediate needs. Nevertheless, I think it covers most of the subjects which will concern you in developing a constitution and bylaws for the Association of Consulting Engineers of Nigeria.

I am requesting that copies of the constitution and bylaws of the Association of Consulting Engineers of Great Britain and also of Malaysia be sent to you as soon as they are available. I thought that the documents of the Malaysian Association may be of particular interest to you because they serve a new and relatively small association and, thus, may be appropriate to your immediate needs.

I will look forward to further communication with you and will be pleased to try to provide information or answers to any specific questions which may occur from time to time in the course of your efforts to form an effective organization of consulting engineers in Nigeria. I wish you every success in your efforts, and I am sure you will develop a constructive and effective association which will be beneficial to the profession of consulting ingineering.

Sincerely,

William W. Moore

WWM db
Enc.

cc: H. Hillebrand NOTE: Please send ACE and Malaysia documents with Coode's comments.

FIDIC SECRETARIAT: *Javastraat 44, The Hague - The Netherlands, Tel. 11 04 46, Cables: FIDICHOUSE*

Fig ii. Difficulties of Visiting South Africa – August 1973

FEDERATION INTERNATIONALE DES INGENIEURS-CONSEILS
INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS
INTERNATIONALE VEREINIGUNG BERATENDER INGENIEURE

FIDIC

RECEIVED
FIDIC SECRETARIAT
- 3 AUG 1973
COPY TO: HCF
ANSWERED ON:

Ref: 448

FROM THE OFFICE OF:

The President,

Mr. H. Hillebrand,
Executive Secretary,
FIDIC
Javastraat 44,
The Hague,
The Netherlands.

2 August, 1973

Dear Hillebrand,

NIGERIA

Mr.Frijlink has sent me a copy of his letter dated 30 July to Mr.Phillips of Nigeria.

It is excellent news that progress is being made with the formation of a Nigerian Association.

There is, however, a problem which I discussed with Mr.Phillips in Amsterdam. He expressed the view that it would be politically impossible for him to come to Cape Town, and also to ask that Nigeria should be admitted at a meeting held in South Africa. It is a great pity - but Paris will only be a few months away.

Yours sincerely,

Fig iii. Correspondence on Paris Conference - February 1975

The Executive Secretary
1.84/1.3(Nigeria)-mb
12th February, 1975

Mr. F.A.O. Phillips
President
Association of Consulting
Engineers (Nigeria)
22, Ogunlana Drive,
Surulere,
LAGOS
Nigeria.

Dear Mr. Phillips,

Thank you for your letter of 5th February from which I noted with great interest that you are planning to attend our annual meeting in Paris together with Mr. Tunde Oyefodunrin.

Of course we would be very pleased to welcome both the President and the Secretary of the Nigerian Association of Consulting Engineers to this meeting which, I hope, will be of interest to you. The final program and registration forms will be issued by our french hosts this month and I shall make sure that you will receive a number of copies.

Mr. Frijlink, Secretary General of FIDIC, told me that you have been planning for some time now to submit to FIDIC copies of your Association's Statutes and By-Laws. In case your Association is considering to establish a regular relationship with FIDIC possibly leading to formal affiliation the Executive Committee would no doubt appreciate receiving these documents as well as some general information on the status of the profession in your country.

Looking forward to hearing from you,

Yours sincerely,

H. Hillebrand
Executive Secretary

c/c: Mr. H.C. Frijlink
Mr. P.J. Mehigan

Fig iv. Application for Membership May 1976

ASSOCIATION OF CONSULTING ENGINEERS OF NIGERIA

RECEIVED
FIDIC SECRETARIAT
18 MEI 1976
FILE: 1.3 Nigeria
COPY TO: SEEN:

60B Coker Road,
Ilupeju,
P.M.B. 1044,
Mushin, Lagos.
Nigeria.
10th May, 1976.

The Secretary General,
FIDIC.
Carel Van Bylandtlaan 9,
The Hague,
Netherlands.

Dear Sir,

Application for Membership

As a result of reports received by the Association of Consulting Engineers of Nigeria from their representatives who have attended a number of your annual General Assembly Meetings, the Association of Consulting Engineers Nigeria have decided to forward this application for membership of the Federation Internationale Des Ingenieurs - Conseils for the kind consideration of the Executive Committee and subsequent approval by the General Assembly.

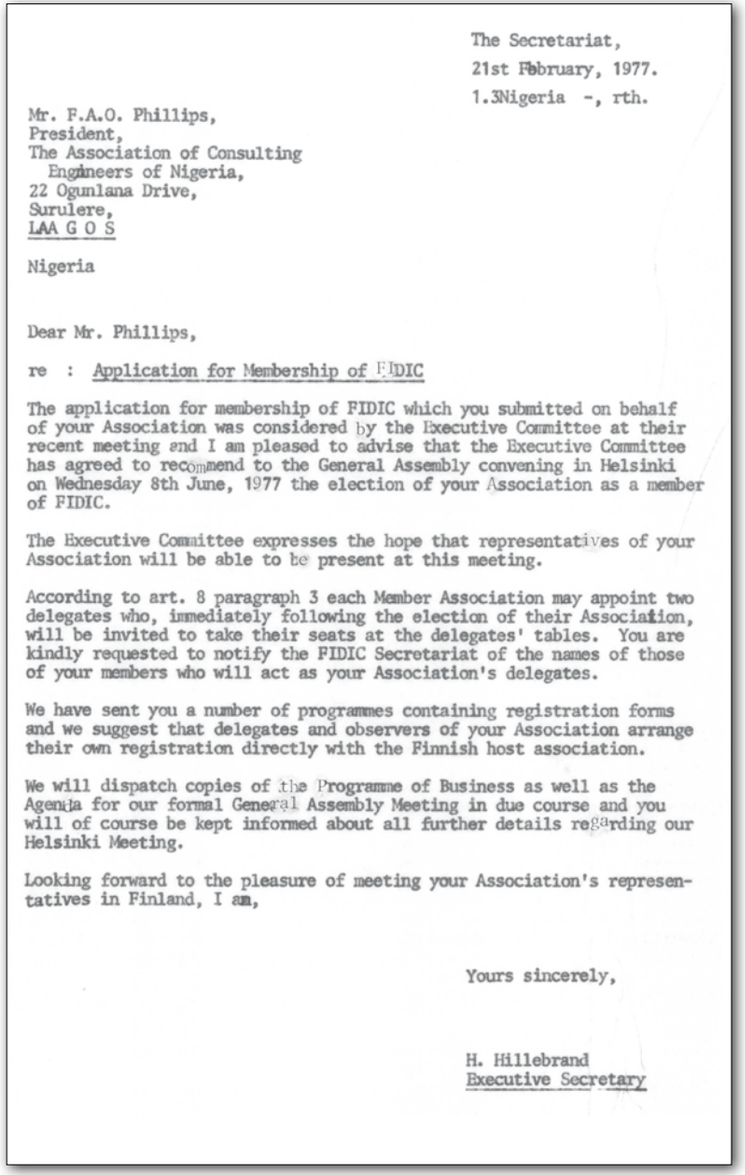
As required under Article 4 of the Statutes of FIDIC a copy of our Memorandum and Articles of Association containing our Statutes and Rules is forwarded together with a list of our members.

We regret the delay in forwarding this application.

Yours faithfully,

F.A.O. PHILLIPS.
PRESIDENT,
FOR:- Association of Consulting Engineers - Nigeria.

Fig v. Formal letter of election of ACEN to Mr. Phillips – June 1977



The Secretariat,
21st February, 1977.
1.3Nigeria -, rth.

Mr. F.A.O. Phillips,
President,
The Association of Consulting
Engineers of Nigeria,
22 Ogunlana Drive,
Surulere,
LAA G O S

Nigeria

Dear Mr. Phillips,

re : Application for Membership of FIDIC

The application for membership of FIDIC which you submitted on behalf of your Association was considered by the Executive Committee at their recent meeting and I am pleased to advise that the Executive Committee has agreed to recommend to the General Assembly convening in Helsinki on Wednesday 8th June, 1977 the election of your Association as a member of FIDIC.

The Executive Committee expresses the hope that representatives of your Association will be able to be present at this meeting.

According to art. 8 paragraph 3 each Member Association may appoint two delegates who, immediately following the election of their Association, will be invited to take their seats at the delegates' tables. You are kindly requested to notify the FIDIC Secretariat of the names of those of your members who will act as your Association's delegates.

We have sent you a number of programmes containing registration forms and we suggest that delegates and observers of your Association arrange their own registration directly with the Finnish host association.

We will dispatch copies of the Programme of Business as well as the Agenda for our formal General Assembly Meeting in due course and you will of course be kept informed about all further details regarding our Helsinki Meeting.

Looking forward to the pleasure of meeting your Association's representatives in Finland, I am,

Yours sincerely,

H. Hillebrand
Executive Secretary

America with only one member association. The member associations are in turn made up of member firms, and FIDIC encourages member associations to have all the consulting firms in the country as its member if possible.

FIDIC tries to address the local interest of these global members through Regional Groupings. The main ones are the Group of African Member Association of FIDIC, GAMA, with its temporary secretariat with the Consulting Engineers of South Africa, CESA, and representing the African interest, and ASPAC, which represents the Asia and Pacific region. There is also the European Federation of Consulting Engineers, EFCA. Although not a FIDIC regional group, it has close working relationships with FIDIC. EFCA's headquarter is in Brussels and its primary purpose is to represent European local interest, mainly, the relationship with the European Union government. The objectives, constitution and methods of operation of the regional groupings are very different.

According to a FIDIC publication:

> *Over the years, individual firms, our true members, have developed from being small, often specialized, firms based on personal ownership into a combination of small firms with similar interests complemented by an increasing number of large, multidisciplinary firms with several thousand employees, at times even with publicly quoted shareholder ownership. The diversity in membership, at the level of individual firms as well as at the national member association level, ensures that as an industry we have the correct range of services to offer our clients, existing as well as potential, on terms that are acceptable to society at large."*

Business Best Practice

FIDIC seeks to assist the member firms of its member associations in their day-to-day business of consulting engineering by providing policies and guidelines that promote best practices in the business. It has a range of publications covering a diverse field which includes selection of consultants, informed purchaser, conflict of interest, consultants in design and build, tendering procedures, project insurance and dispute resolution processes.

Work on quality and risk management has been accepted as an important move to improve the ability to provide value-added services to

clients and, at the same time, enhance efficiency. Through collaboration with other stakeholders such as the United Nations Environmental Programme, tools to ensure sustainability in business practices and at every stage in the project cycle have developed.

Again, according to a FIDIC publication:

> *As a representative of business interests, FID1C has also promoted procedures for the proper selection of consultants, accepting the fact that ability, experience and integrity, in other words qualifications, have to be considered, outweighing all other considerations in retaining consultants, including price. Our partners in direct negotiations have mostly been the multilateral development banks, but documentation has also been used as a basis for local negotiations at the national level.*

Ethics/ Integrity

A major challenge of the construction industry, and indeed the whole world, is the issue of corruption. FIDIC tries to confront this issue aggressively. There is a code of ethics for its members, and a Business Integrity Management System, BIMS, for member firms. It is also developing an integrity management system for clients' organisations. It partners with Transparency International in promoting integrity in the construction industry.

Image

Engineers generally, including consulting engineers, have always felt unappreciated by the society at large, and FIDIC tries to promote the image of consulting engineers by giving them a voice in the international arena. In this respect, it has a biennial meeting with international lending agencies, engages with United Nations institutions such as UNDP, and cooperates with other private sector interests such as Transparency International and the World Trade Organisation. It also encourages its members to speak out on national engineering issues so that they can be heard and understood, and their contribution to development appreciated.

Sustainability

FIDIC, perhaps before most others professional associations, had recognised the critical importance of sustainable development and participated fully in understanding the phenomenon and in developing a response to it. It has, in the last few years, developed a project

sustainability management guide for use of the member firms of member associations.

Globalisation

The whole world political, economic and social landscape is in a continuous state of flux. While some of its member associations represent fully developed economies, others represent developing nations at different rates of development, while yet others are underdeveloped. FIDIC has always understood this, and continues to seek appropriate responses. The regional groupings are an attempt at this. Even within the regional groupings, however, there are still considerable divergences among members. ASPAC is the extreme example of this with developed countries of Japan, Australia and New Zealand, rapidly developing countries of China, India, Singapore and Malaysia, and less developed economies all coexisting within the group.

Today, it is recognized that the private sector consulting industry can contribute substantially to capacity development at both the national and the international level. FIDIC's strategy is to lead and support its membership. So capacity building remains on its agenda, and the development and advocacy of appropriate tools based on documents, standards, guidelines and best-practice manuals is an ongoing activity.

Quality

FIDIC strongly promotes the position that quality is eventually both the objective and measure of consulting engineering services. Quality must therefore be prevalent in all phases of the industry, from project conception through design development to construction, operations, maintenance and disposal. FIDIC has produced several quality documents in pursuance of this important philosophy.

Organisation and Administration

The highest body in FIDIC is the General Assembly. This is made up of delegates from Member Associations. Today, representation varies from a minimum of two to a maximum of six members per country, depending on the size of the consulting engineering industry in the respective countries.

The General Assembly elects an Executive Committee to run the affairs of the Association. The Executive Committee comprises of nine members, no two of whom may be from the same country. The election

is on individual basis and the members are not seen as representing their individual countries. The Committee recommends a president, vice president and treasurer for the ratification of the General Assembly.

FIDIC secretariat is presently located in Geneva and is headed by a full-time Managing Director and a General Manager supported by four or five part time staff. Most of the original professional work of FIDIC is carried out through volunteers in committees, task forces and forums. Currently, there are nine committees, seven task forces and five forums.

FIDIC has several business products for the use of the consulting engineers. The most popular are the Contract Documents which are used by the World Bank and other international lending organisations, and many other public and private sector organisations.

ACEN in FIDIC

Nigeria continues to play a very active role in FIDIC. After several attempts, Dr. Joseph Ibikunle Folayan was elected to the FIDIC Executive Committee. He was the first from Africa to be so elected and he served from 1988 to 1992, a four-year term. During his tenure, Dr Folayan brought the attention of the Executive Committee to the challenges of building a viable consulting engineering industry in Africa. It was at this time that the formation of GAMA was being actively debated and he was at the centre of it all. While awaiting the formation of GAMA he had responsibilities for African affairs on the committee.

Since his election, it has now become traditional for an African to always be on the EC. He was succeeded by Steyn Laubscher of South Africa in 1992. Gamal Nasar of Egypt was elected in 1994, Rafik Meghji of Tanzania in 1999, Bayo Adeola of Nigeria in 2003 and Patrick Batumbya of Uganda in 2007.

The second attempt to get a Nigerian elected into the EC was at Edmonton in 1998. The tenure of Gamal Nassar was coming to an end and a vacancy for another African was perceived. Our erstwhile past president, Lanre Sagaya was considered the most eligible candidate not only from Nigeria but also from Africa. Lanre Sagaya had attended most of FIDIC conferences up to that time and was easily one of the most experienced Nigerians on the international scene. He was also a very strong supporter of ACEN both morally and financially, and his nomination papers were filed. The international community however voted massively for the American candidate who was eventually elected. Africans again refused to show the solidarity needed in such international elections. The African community presented a second candidate thus weakening the already fragile votes of this constituency.

Rafik Meghji was elected in 1999 and his term on the EC ended at the Paris conference in September 2003. With the exposure to FIDIC activities already gained by participation on FIDIC task forces, Bayo Adeola expressed interest in contesting for one of the vacant slots, and this was approved by the ACEN Council. His papers were subsequently filed with nominations by Uganda and Nigeria – FIDIC rules had been revised to require nomination by another country. Again, Africa could not agree to go with only one candidate and a second candidate, Peter Sibernagl of South Africa, was presented for election thus diffusing the African votes.

This time around, Nigeria had learnt some lessons from the Edmonton experience and efforts were put into actively seeking support for the Nigerian candidate. The results of the election were announced at the AGM in Paris and three candidates were successful. The Nigerian born Greg Thomopoulos from the United States had the highest vote. Maxime Mazloum from France, the organisers of the conference, had the second highest. These two results were not surprising. The American candidate usually gets elected as FIDIC considers the US critical to its membership. It is also usual for the candidate from the host country to get elected if he contests, and France did not come as a surprise. Besides, Europe always has two or three seats on the executive committee. The good news was therefore the election of Bayo Adeola from Nigeria, beating the other three candidates from South Africa, India and Italy.

Bayo Adeola spent four years on the FIDIC EC and had responsibilities for Africa and Capacity Building. He was able to persuade the EC and FIDIC President Jorge Diaz Padilla to set up a GAMA Task Force in September 2005. The task force consisted of five members, past President Eigil Pedersen, then GAMA chair Patrick Batumbya, South African Association of Consulting Engineers' chief executive Graham Pirie, Marc Parent, a Canadian consulting engineer and Bayo Adeola as chairman. The task force deliberations lasted about a year, with meetings in Lagos and Dar-es-salam. Their recommendations were

accepted by both the GAMA and FIDIC executive committees and are currently being implemented. By their efforts, GAMA has become a much better structured organisation with a bright future.

FIDIC Conferences

Perhaps the most popular FIDIC event among Nigerians is the Annual FIDIC Conference. This is usually the climax of the FIDIC year where all the Member Associations and individuals from their member firms and other stakeholders in the construction industry converge for an Annual Conference and the Annual General Meeting. The venue changes from year to year with hosts bidding for the hosting rights. Venues in the last ten years include Istanbul in Turkey, Cape Town in South Africa, Edinburgh in the UK, Edmonton in Canada, Montreaux in Switzerland, Hawaii in the United States, Acapulco in Mexico, the Hague in the Netherlands, Paris in France, Copenhagen in Denmark and Beijing in China. Dr. Joseph Folayan had, as at 2002, attended twenty FIDIC successive conferences. Other very regular attendees include past presidents Lanre Sagaya, Segun Adesina, Mayen Adetiba, and current president Bayo Adeola. It has become usual for Nigeria to have one of the largest delegates at the conference.

Presentation of papers and participation at discussion forums are the major activities at FIDIC conferences, and Nigerians have had some opportunity to fully participate. Unfortunately, ACEN cannot be regarded as an active paper writing association and participation at these activities have fallen short of expectation. In 2001, the organising committee of the Montreaux conference specifically invited a paper from Nigeria, and by competition, Bayo Adeola and his paper were selected for the conference which was well received. In 2005, Suleiman Adamu, the then chairman of the International Relations Committee of ACEN was invited to present at a discussion forum in Beijing.

One event that left ACEN members disenchanted with the FIDIC EC was the bid for the 2012 conference. On assumption of office, Jorge Diaz Padilla had identified that in its almost one hundred years history, only South Africa had hosted FIDIC conference in Africa. He would want at least one more conference to be held in Africa before the centennial in 2013. He, therefore, invited African countries to express interest in the hosting of this event. Ordinarily, Nigeria would not have offered to host FIDIC conference at that point in time. In response to a call for an African conference, however, ACEN felt an obligation to respond. ACEN, therefore, put together a proposal which got the approval of the nation's president and other key political leadership. The managing director of FIDIC, Enrico Vink, visited the facilities to be used and found them suitable. ACEN considered itself, along with South Africa, to be the most committed African countries to FIDIC. ACEN was, therefore, hugely disappointed when FIDIC EC chose the Tunisia Association, a much younger member of FIDIC with less participation and commitment history in FIDIC affairs for the event.

FIDIC Committees and Task Forces

FIDIC operations are organised around committees and task forces. Task forces are usually formed to address specific short-term concerns while committees address issues of going concern to the Association. Nigerians have had the opportunity to serve on these committees, though not as much as our attendance at the conferences reflects.

In 2001, Bayo Adeola was invited to serve on the Governance Task Force that reviewed the structure of governance of FIDIC. It was chaired by the then vice president (later president) Richard Kell of Australia. Other members of the committee included past president of FIDIC Wayne Bowes of Canada, then treasurer Eric Laglo of Switzerland, then EC member Touradj Amirsoleymani of Iran, Jim Thomas of the USA, John Cederberg, then Director of the Denmark Association and Guro Fuji, secretary of the Japanese Association. The task force met for about a year and produced the Governance report. Again in 2003, Bayo Adeola was invited to serve on the Strategic Review Task Force. FIDIC periodically reviews its strategic objectives to make sure the right issues are being addressed, and this was the primary objective of this Task Force. The chairman was Jorge Diaz Padilla of Mexico, the then vice president (later president) of FIDIC. Other members included past president Wayne Bowes of Canada, Bill Howard of the United States, Lailun Ekram of Bangladesh and Timo Myllys, then secretary of the Finland Association.

Several Nigerians have also served on various committees. Past presidents F. A. O. Phillips, Adenrele Adejumo, Michael Adesina and Engr. Yemi Songonuga served on the Risk Management Committee for several years while past president Lanre Sagaya recently served on the Business Practice Committee. Bayo Adeola has been the chair of the Capacity Building Committee since September 2007.

FIDIC Directors & Presidents Meetings
Very strong vehicles for promoting interaction between FIDIC and the Member Associations are the Directors & Secretaries, D&S, meetings, and the Presidents meetings which take place during the annual conference. These two meetings leave the AGM essentially as a formal event for ratifying decisions as required by law.

Perhaps the more effective of the two in the dissemination of information, sharing of experience and peer benchmarking is the D&S, meeting. This meeting usually holds for a whole day the Saturday before the commencement of the conference and a very high degree of networking and sharing is achieved. ACEN has not always been able to take full advantage of this opportunity. Without an executive secretary, the honorary secretaries have not always been able to afford the time and financial resources to attend these meetings. Awareness of FIDIC activities has therefore always been limited despite the high attendance at the conferences.

The Presidents' meeting has a different objective to that of the D&S. It lasts a shorter time and usually focuses on contemporary policy issues which are debated for input and consensus before being placed for voting at the AGM. Nigeria has usually participated fully in this as all our presidents have been able to pay their way to the events.

To date, FIDIC remains the centre piece of ACEN international relations. This it does through active participation in FIDIC activities, and active support and leadership of GAMA.

Group of African Member Association of FIDIC, GAMA
FIDIC started as a wholly European association but grew to be mostly made up of European and American Member Associations at the time ACEN joined in 1977. The primary interests of these groups were rather different from those of their smaller and less developed members. At the time, FIDIC then addressed mainly international business with a lot of its activities centred around international financial institutions such as the World Bank and the African Development Bank. The need for the African members to get together and identify and address their common problems soon became evident. At every FIDIC conference, therefore, African members would meet to share experience and discuss the challenges of building viable consulting industries in their home countries. These meetings soon led to the decision to formalise the interaction among African consultants and gave birth to the Group of African Member Associations GAMA of FIDIC.

The first GAMA meeting outside FIDIC conference was in Nairobi, Kenya from the 27th to 30th November 1993. ACEN members who attended were Engr. Chief V.O. Oyefodunrin, Engr. J.O. Sonuga, Engr. Dr. J.I. Folayan, Engr. Otunba M.O. Adesina, and Engr. O.A. Ogunbayo. Today, there are twelve active Member Associations in GAMA and include Botswana, Egypt, Ghana, Kenya, Nigeria, South Africa, Sudan, Tanzania, Tunisia, Uganda, Zambia and Zimbabwe. Conspicuously missing are the French-speaking countries.

Since the first meeting, annual conferences of GAMA have taken place regularly with different countries volunteering to host. Countries that have hosted include Tanzania in 1994, South Africa in 1995, Egypt in 1996 and Zimbabwe in 1997. Despite Nigeria's active participation in GAMA ACEN was hesitant to hold the conference for security and infrastructural reasons. There were fears that participants would be unwilling to come to Nigeria, and concerns about safety and infrastructures to host the conference. In 1997 in Harare, Zimbabwe, the then executive committee led by Aremo Okunoren as president and Bayo Adeola as secretary took the challenge and Nigeria accepted to host the 1998 conference. The conference chairman was Mayen Adetiba (later president of the association) and the committee included elder statesman Engr. Adeoye Fowora. In order to avoid the insecurity of Lagos, Abuja was chosen as the venue.

The Abuja meeting turned out to be a huge success in terms of planning and execution. It indeed set a new standard in the organisation for GAMA conferences. The fear of poor attendance was however validated by the presence of only four countries out of the then nine active members. Egypt, Zimbabwe and Uganda turned out to make the conference an international one. Notably absent were the then president of FIDIC, Steyn Laubscher from South Africa, the South African Association and the Zambian Association who had promised to attend. Tanzania and Kenya had made no commitment and also did not attend. Those who attended were greatly impressed by both the quality of the conference and the safety of Abuja.

Thereafter, the conference held in Kampala, Uganda (1999), Gaborone, Botswana (2000) and Lusaka, Zambia (2001). It was difficult to get a host

for the 2002 conference, and the South African Association offered to use the platform of the Built Environment conference scheduled for the period for the AGM. Zambia volunteered to host again in 2003 and was the first country to host the conference twice, and this time the delegates were taken to the beautiful Victoria Falls at the village of Livingstone. Nigeria again volunteered to host the 2004 conference. The turnout of countries was better than the first attempt. South Africa, Zambia, Uganda, Ghana and FIDIC president Richard Kell all attended. GAMA treasurer Bob Izzette planned to attend and indeed bought a ticket and arrived at the airport only to be told that he needed a visa to come to Nigeria. The conference held in Kampala, Uganda for a second time in 2005, Bagamoyo, Tanzania in 2006, Gabarone, Botswana for a second time in 2007, Tunis, Tunisia in 2008 and Durban South Africa in 2009.

Nigerians have also played a significant role in the leadership of GAMA. As already stated, Dr. Folayan was in charge of African affairs while on the executive committee from 1988 to 1992, and this role was taken over by his successor, Steyn Laubscher of South Africa. The first chairman of GAMA was perhaps Gamal Nasar of Egypt who chaired the Association from 1994 to 1995. Dr Folayan was elected in abstentia as his successor in Cairo in March 1996 for a two-year term with John Walusimbi of Uganda as vice chair. Walusimbi succeeded Folayan as the chairman in 1996 with Mayen Adetiba as the vice chairman. All this time, the secretariat remained in South Africa whose association had volunteered to provide the service. In Gaborone in the year 2000, it was decided that a honorary secretary be appointed and Paul Karakezi of Kenya was so appointed along with Levi Zulu of Zimbabwe as chairman, Leonard Magara of Zimbabwe as vice chairman. and Bob Izzette of Botswana as treasurer. For some reasons, however, Paul was never able to discharge his responsibilities as secretary. In Lusaka in 2001, Bayo Adeola of Nigeria was asked to fill the gap and he took office as GAMA secretary. The executive committee of Levi Zulu, Leonard Magara, Bayo Adeola and Bob Izzette stayed in office until March 2004 when they were succeeded by the team of Patrick Batumbya of Uganda as chair, Edet Amana of Nigeria as vice chair, Craig Clarke of South Africa as honorary secretary while the treasury remained in Botswana. South Africa continued to provide the secretariat pro bono until the adoption of the new constitution in 2007 when plans for the establishment of a full secretariat for GAMA was approved.

From its founding, ACEN has remained in the forefront of the growth and development of GAMA. GAMA however was for a very long time rather weak. Since the completion of the work of the GAMA Task Force, however, things have started to look better. .A seven-member executive committee is in place to run the affairs of the Association. The first president under the new organisational structure and constitution was Exaud Mushi of Tanzania. He was succeeded by Mayen Adetiba of Nigeria in March 2009 in Durban, South Africa.

The African Development Bank

The African Development Bank was set up to provide Africa with the necessary capital for the provision of infrastructures, physical, social and economic. It provides loans to African countries for a wide range of projects. It is therefore basic that the activities of the Bank would be of interest to ACEN. In the early nineties, GAMA approached the Bank to support the setting up of a secretariat for GAMA. The bank, however, saw GAMA as being engineering focused and wanted an association with a wider coverage of services. This gave birth to the Federation of African Consultants, FEAC (Federation des Conseille Africaine, FECA). The Bank provided the funds for the setting up of a secretariat for FEAC in Abidjan. ACEN encouraged its members to join the organisation, which was essentially at individual and firm levels.

FEAC did not survive as an organisation and has become of little effect. ACEN had to directly engage the African Development Bank through visits and invitation to Nigeria. Under the leadership of Otunba Michael Adesina as president and Bayo Adeola as secretary, ACEN delegates attended a meeting at the Bank to resuscitate FEAC and, through the goodwill and network of the then vice president Lanre Sagaya got access to highest level of management. We met with Mr Bisi Ogunyemi, vice president, and John Mensah-Quinoo, head of procurement. At these meetings, we learnt of the Nigerian Trust Fund, a donor fund by the Nigerian government for selected projects in other African countries. Although this is a wholly Nigerian fund, the government did not prescribe the use of Nigerian consultants and contractors as conditions for the facility, a situation that ACEN would have liked to see. The relationship formed from the visit developed so well that ACEN was able to invite the Bank to conduct workshops in Nigeria on the procedure for the procurement of goods and services from the Bank. Despite the relatively low cost charged for these workshops, very few ACEN members availed themselves of the opportunity.

To date, the involvement of Nigerians in African Development Bank projects remains very weak and the network poorly developed.

Reflections

It is important to reflect on almost forty years of ACEN in FIDIC so as to be able to chart the way forward in international relations of ACEN. The first obvious value gained from the membership of FIDIC is that ACEN is part of a very large community of engineering consultants from all over the world and thus maintains relationships with member associations, member firms and individual engineers from about eighty countries. These are tremendous potential resources for the individual engineers, member firms and ACEN itself. FIDIC has provided the platform for members with sufficient resources to travel the world, and those with interest to serve on international committees. Issues of international importance to engineering consultants are discussed and awareness and knowledge improved. GAMA has been exceptionally beneficial in getting African engineers to meet and network, and discuss problems common to Africa. Individual friendships have developed. However, the synergies that one would expect would emerge from this network have been slow in coming. International partnerships, joint ventures and similar associations have been few and far between.

It sometimes seems that FIDIC procurement policies and publications are targeted at the exploitation of the African and developing countries' markets. FIDIC Conditions of Contract are hardly used for developed countries' projects, all of which have their local procurement documents. Practice of engineering is highly controlled in developed countries with very little opportunities for engineers from less-developed countries to participate. On the other hand, FIDIC continues to promote the adoption of procedures that encourage the participation of international consultants in Africa. The meeting of FIDIC with the international multilateral organisations are most often attended by consultants from the developed world and not enough third world voices are heard.

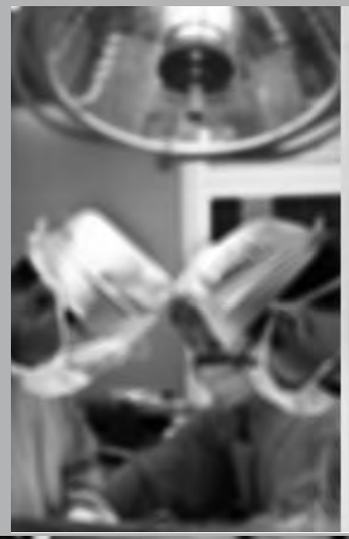
Third world focused projects within FIDIC often meet with difficulties, and when approved have even more difficulties at implementation. The Capacity Building Committee, in particular, has made very little progress in the past eight years.

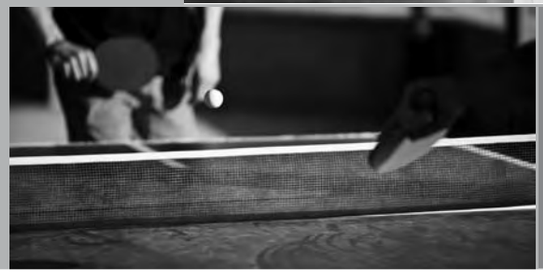
Membership of FIDIC EC, although representative of the FIDIC membership is also permanently distorted in favour of the developed

countries, which are in the majority. The weighted voting introduced a few years ago gave additional advantages at the polls to this group to consolidate the number and resource advantages. It is usual to have two or three each from Europe and North America. The norm is to have one from Africa and two from Asia and Pacific region. It therefore always seems like a lone voice in the committee of nine, wanting to be understood. And sometimes the stronger groups can be distracting. EFCA has been competing with FIDIC on several fronts in the recent past.

Yet, there is no doubt that Nigeria and Africa, and indeed the world consulting industry needs a world association such as FIDIC. Perhaps strengthening the regional groupings is the way forward. Perhaps a more business-like structure with a bigger functional secretariat is the way. FIDIC carries out both governance and strategic reviews from time to time to address these issues. Perhaps the next review will be more visionary.

ACEN also needs to carry out periodic review of its international relations.





CHAPTER 13

ENGINEERING IN NATIONAL DEVELOPMENT PLANNING

Images: Engineering in Development

Opposite
Top: Equipment in Health Care Delivery. Source. iStock
Middle: Sports facilities in social infrastructure. Source: iStock
Bottom: Young children in school. by Ayo Alaka
Above: Engineering in Agriculture. Source: iStock

In reviewing development planning in Nigeria, it is evident that while the nation has clamoured for infrastructural and economic development, this has not been understood as and correlated with the development of engineering in the country. We have wished to have infrastructures and economic development only in words, and enacted policies and acted in ways that would ensure that we did not have these infrastructures or economic development. This failure to act appropriately has been characteristic of the three governing classes that have ruled Nigeria, the colonial government before independence and the civilian and military administrations since independence.

Ikpeze, Soludo and Elekwa, in their paper, "Nigeria: The Political Economy of the Policy Process, Policy Choice and Implementation" postulated that this failure to act appropriately has not been an accident but a reflection of the dynamics of policy formulation and interest groups. They identified the three interest groups that have dominated the policy environment in the developmental process in Nigeria. As the state or governance class consisting of political office holders and civil servants, ethnic groups which largely drive the political process, and the business community or private sector. None of these interest groups has emerged to have the overall interest of the nation as its priority.

They stated that for meaningful development to take place:

> *There has to be 'The politico-social and governance arrangement that is broad-based and that builds "national consensus" or "national vision" for industrialization; an ideology of development that supports wealth creation, is export-oriented, prone to competition, and is market-oriented. Without this governance structure at the meta-level, it is difficult to see how the meso (institutions and infrastructure) or the macro (macro stability and competitive real exchange rate regime) or the micro-level (emergence of capable and competitive firms) that support industrialization can materialize.'*

Unfortunately, Nigeria has been unable to build a consensus around a national vision for development. In policy formulation, on projects and products without an underlying philosophy of development. These projects and products have been driven largely by financial benefits to individuals, group benefits to ethnic groups, or short term advantages to political groups. Often, these interests have converged into extractive capitalism rather than production and wealth creation. Policies have been designed and implemented by the interest groups to maximise their extractive power on the nation's resources.

Ikpeze et al. went on:

> *A key implication of the fractious society and predominance of sectional interests is that there is hardly any single-minded focus in the design and implementation of a "national agenda". National vision is missing (except in the rhetoric), while the nature of implementation often reveals the intended objective of the policy.*

This chapter reviews the development plans that have been made since the colonial times, the key policies of the development plans, the recognition or otherwise of the key role of engineering, and the opportunities and enabling environment created for their achievements.

Under the colonial administration, Nigeria had one major development plan, the Ten-Year Plan of Development for Nigeria (1946-1956). Nigeria has had four development plans since independence: the First, Second, Third and Fourth National Development Plans of 1962-1968, 1970-1974, 1975-1980 and 1980-1985. Since 1985, there have been no other development plans. In the late 1980s, we had the Structural Adjustment Programme, SAP, under Babangida. An attempt was made at visioning, the first being Vision 2010 under Abacha and the current Vision 20-2020 under Umar Yar'Adua. Under Obasanjo, we had the National Economic Empowerment and Development Strategy, NEEDS.

Ikpeze, Soludo and Elekwa summarised the key characteristics of the development plans since independence as follows:

> *Following political independence in 1960, the successive governments adopted the import-substitution industrialisation and five-year development plans (as was the case in most developing countries) and with financial assistance by international financial institutions. In the 1970s, nationalisation of foreign industries was in vogue and Nigeria tagged on, and the oil boom provided the impetus for deepening the strategy of import substitution and self-sufficiency. The 1980s, especially*

following the publication of the Berg Report in 1981 saw the implementation of structural adjustment programmes (SAPs) in most of Africa, and Nigeria was not left out. The broad direction of policy has since been characterised by liberalisation and emphasis on export orientation and competitiveness.

Thus, while we might think that Nigeria is different or peculiar, the development policies generally adopted have been the generic prevailing universal policies of the time.

Pre-Independence Development Strategy

It is clear that the pre-independence colonial government did not attempt to develop local production capabilities and that the focus was on the development of infrastructures for raw materials export and finished goods import. Even in the areas of infrastructures, the strategy was to import as much of finished goods as possible. Bridges were designed and manufactured in the UK and shipped to Nigeria for assembly. The industries that were introduced were light industries without any heavy engineering. These were not chance events but a deliberate policy of strategic dependence. The first local consulting firm only emerged in 1959, a hundred years after the first secondary school. The reasons for the emergence of local contractor are partly the labour intensive and physical location peculiarities of projects in the sector and not due to any strategic policies. And even then, the bigger projects were always reserved for the foreign companies.

For the pre-independence colonial period, Ikpeze et al. had this to say:

Public policy and private initiatives promoted investments mostly in extractive industries and distributive trade rather than manufacturing (Soleye, 1987). The manufacturing industries that were established by alien trading firms during and immediately after World War II concentrated on light industrial goods such as detergents, confectionery, soft drinks, and textiles, as a way of making the transition from purely commercial activities into the beginnings of import-substituting manufacturing (NCEMA, 1995). This initial penchant for the production of light consumer goods set the stage for two drawbacks that have persisted in the nation's industrialisation effort to date: neglect of technological development and reliance on imported production inputs.

This state of affairs was not due to any preference on the part of the imperial power for a laissez-faire approach in economic matters. Rather it stemmed from the reality that Britain's national interest lay not in the economic or industrial development of Nigeria but in the development of basic infrastructure (rail and road networks) to facilitate the evacuation of primary products and the distribution in Nigeria of manufactured goods imported from the metropolitan economy (Ikpeze, 1991). Attention was lopsidedly directed towards the development of agricultural produce to serve as a raw-material base for British industry. Local industrial development received short shrift, being supported by a patchwork of only a few ad-hoc incentives such as tax and import duty relieves.

This position is supported by the historical account of the arrival of engineering in Nigeria. The major projects were in the areas of communication and transportation, and no manufacturing was done for a long time.

According to Ikpeze et al, what passed for trade and industrial policy amounts to no more than a patch-work of ad hoc measures which may be categorised as follows:

1. Incentives — the enactment of legislation offering tax and import duty relief to industrialists e.g. Aid to Pioneer Industries Ordinance (1952); Industrial Development: Import Duty Relief Act (1957); Industrial Development: Income relief Act (1958).
2. Infrastructural Support — the provision of water, power and other facilities such as industrial estates, albeit on a severely limited scale.
3. Industrial Promotion — the dissemination of basic information about the Nigerian economy among prospective industrialists, especially foreign investors.
4. Credit Facilities — the establishment of the Federal Loans Board and regional development corporations, provision of government guarantees for external loans.
5. Safety of Foreign Investment — guarantee against expropriation and nationalisation, promise of easy repatriation of capital, profits and dividends.
6. Protection from Foreign Competition — high tariff walls, import licensing, and quantitative restrictions.

Pre-independence national governments in the regions, however, did try to develop productive capabilities in Nigeria, being more sensitive to the needs of the people. The greater attention paid to education at all levels, and to infrastructures and manufacturing targeted at the populace were strong indicators of this. The mainstay of the regional economies was agricultural and efforts were put into developing capabilities in these areas. This period saw the introduction of the various industrial estates of Lagos, Port Harcourt and Kano. There is, however, no evidence that the strategic significance of engineering was appreciated. The leadership at this time consisted mostly of lawyers, teachers and doctors. Engineering career was still generally uncommon, unattractive and poorly rewarded.

First National Development Plan 1962 - 1968

Soon after Independence in October 1960, the Federal Government prepared the first National Development Plan. The main thrust of this plan was the use of resources to enhance production and economic growth. The newly elected governments were still very nationalistic and very interested in the development of the country and its people. Agriculture and mineral resources development were at the core of the plan. It envisaged a capital expenditure of =N=2.2 billion. However, social and regional development received only 24.4 per cent of this budget while the economic sector got 67.8 per cent. This did not result in social and regional development. The plan did not specifically address the challenges of developing capacity in engineering and production.

Perhaps the greatest achievement of the sixties for engineering was the emergence of universities and polytechnics for the training of engineers and technologists. Realising the importance of the construction industry in executing the plan, the administration of Abubakar Tafawa Balewa adopted a policy of assisting and patronising indigenous contractors as has earlier been identified and a few of them thrived. The consulting sub-sector remained largely in the hands of expatriate companies, with very few local entrants. The relatively few engineers in government were fighting to break the discrimination barriers between them and their expatriate colleagues. The strategy for industrialisation was by import substitution. Competition among the regions ensured the distribution of industries along regional lines, hence the growth of the regional industrial areas. The industries introduced were mostly light industries largely dependent on imported technology and raw materials. These industries, however, remained largely in the hands of foreigners, both in financial ownership and technologically.

The sixties were, however, soon engulfed in political crises that severely stressed the fabric of the country and its existence as one nation. Starting with the political crises in the west as early as 1962, it resulted in a military coup in 1966 and culminated in the civil war from 1967 to 1970. This derailed the implementation of the national development plan under the civilian administration.

The plan did not, however, appreciate the strategic importance of engineering in national development and thus did not build around it.

The Civil War Period (1967–1970)

The civil war provided the opportunity for local engineers to exhibit their capabilities. On both sides of the war, local engineers played prominent and innovative roles in supporting the war. It is ironical that it was only during the war that local engineers had the best chances of proving their mettle. These efforts and contributions, however, turned out to be just a matter of expediency rather than a policy thrust and appreciation of their skills and potentials, for no sooner had the war ended than foreign contractors and consultants arrived in droves and resumed the domination of the industry. Consolidation of the achievements of PRODA and using this as basis for technological development was not embarked upon.

COREN Decree of 1970

The establishment of the Council for the Registration of Engineers in Nigeria (COREN) in 1970 during the tenure of the then Commissioner for Works and Housing, Mr. Femi Okunnu, was a major achievement of this period. The decree sought to place the development of engineering in Nigeria in the hands of Nigerian professionals. The decree, however, came when engineering development was still very young and could not take full advantage of its intent.

Even at this time, however, the reaction of foreign major interests in engineering to the promulgation of the decree was clear. Reserving engineering responsibilities for Nigerians was strongly resisted and had to be expunged from the decree. While ultimately, legal, medical and architectural practices were restricted to Nigerians, engineering was left and still remains wide open to all and sundry without any reciprocity from foreign governments. A major exclusion clause in the decree is that COREN shall not register construction companies. The reason for this is not clear. If the Council is to regulate engineering in Nigeria, this must of course include engineering in the construction, industrial and the oil and

gas sectors. Exclusion of these sectors in the decree constituted strong limitations in both the intent and the actualisation of the COREN decree.

Another weakness in the decree is that the Council reports to the Minister of Works and is not an independent organ of government. As discussed below, such leadership has not been in the hand of engineers or driven by clear national policy objectives. The result is that COREN has only been able to ensure the registration of Nigerian engineers with little influence on the regulation of engineering in the country which essentially still remains in expatriate hands. The major advantage derived from the decree was the springing up of consulting firms in the country.

The Council has often lacked vision and commitment in the definition of its objectives, and the execution of its defined assignments. It remains largely an extension of the bureaucracy, carrying out routine functions of registration and conferences, with no policy positions on major engineering issues in the country. It is difficult to say that it has contributed in any significant way to the development of engineering in the country.

Second National Development Plan (1970 – 74)

At the end of the war, the Gowon Administration embarked on the Second National Development Plan. The emphasis in this plan was reconstruction, rehabilitation and reconciliation. It was aimed at re-uniting the nation and creating a just and egalitarian society by reducing inequality in the distribution of income. The designers of the plans were mainly the military and senior civil servants. Although it received inputs from the states, these were themselves run by military governors in a hierarchical and unitary form of government, hence they could not be considered as independent inputs. Just coming out of the war, the private sector was also poorly developed and the political class had not fully regrouped. The total budget under this plan was =N=3.2 billion. The engineering emphasis was on the rehabilitation of facilities damaged on both sides during the war, and provision of new ones.

Two major events had severe impact on this plan. The first was the Indigenisation Decree of 1972 which tried to transfer the ownership of foreign owned companies to Nigerians. The second was the dramatic increase in the price of oil which made unanticipated income available to the country.

The intention of the Indigenisation Decree was to allow greater participation of Nigerians in the economy of the country, which was then dominated by foreigners and their companies. The real effect, however, was that it was the senior military and the civil service class, and a few private sector players who had access to both information and capital that bought up these companies. Not being entrepreneurs or industrialists, the main benefit was the enhanced income and status of these individuals and little benefit to the country. Indeed, rather than use their ownership of the company to benefit the nation, they continued the exploitative practice of the foreign owners to maximise profit, this time with them as part of the beneficiaries. Thus while the boardrooms had Nigerian ownership, the shop floors had foreign control and the nation was the worse off for it. A new class of industrialists made up of ex-civil servants and military officers with no experience and largely selfish interest was emerging.

The effect of the oil boom was to significantly increase the scale of the Second National Development Plan. In addition to infrastructural development, the country could now embark on industrialisation aggressively. The scale and scope of infrastructural development has been discussed in details earlier. Manufacturing also boomed, with petrochemical plants, car assembly plants and iron and steel plants being major examples. These were all owned and driven by government, led by the military and senior civil servants. This leadership had neither business nor entrepreneurial skills, with experience mainly in administration. There were very few engineers, entrepreneurs and industrialists in the leadership of the time, and the political class was still suppressed. The vacuum was filled by the emergence of the public servants in business and opportunistic private sector businessmen with access to them. This reinforced the new emerging class of Nigerian industrialists and businessmen.

Partly because of inadequate engineering knowledge of project technical sustainability, partly because of lack of entrepreneurial knowledge of project financial and economic sustainability, and partly because of the need for self-survival of the ruling cadre, project choices were often technically and financially unsustainable and only satisfied short term political interests. Indeed, boards of government-owned companies were filled with political appointees rather than technically and financially competent persons. The result was generally inefficient, unprofitable companies that were being exploited by their own boards

and management.

The Federal Government adopted a policy of involving local contractors and consultants in the reconstruction works as much as possible. This was achieved by actively patronising local companies and partnering them with expatriate companies for complex projects. There was, however, no specific strategy for the development of the sector and it remained free and open to international companies.

Third National Development Plan 1975 - 1980

By the time of the Third National Development Plan, the oil boom had fully matured, and money was indeed no more a constraint to development. The Plan was therefore more ambitious and grandiose in concept and scope than the earlier ones. It sought to use revenue from oil exports to achieve radical economic transformation. It also laid emphasis on social and physical infrastructures including housing, healthcare, water supply, education, rural electrification and community development. The expenditure estimate of =N=30 billion, compared with =N=3.2 billion in 1970, was later raised to =N=53.6 billion.

The Plan was started under the Gowon administration and completed and implemented largely under the Murtala/Obasanjo administration. The military and senior civil servants had now been in government for about ten years and felt more confident in their expertise. The plan was thus still dominated by these limited stakeholders. The business class that had emerged was not a product of entrepreneurship or vision, but opportunistic purchase of companies from the indigenisation decree. Thus, although the organised private sector was involved in this plan, the interests of the interest groups, as Ikpeze et al. stated, had converged into an exploitation of the system.

Quoting Schatz, 1984, Ikpeze et al. stated as follows:

> *For the most vigorous, capable, resourceful, well connected and lucky entrepreneurs and potential entrepreneurs (including politicians, civil servants, army officers, etc.) productive economic activities, the creating of real income and wealth, has faded in appeal. Access to and manipulation of the government spending process has become the golden gateway to fortune.*

Despite this ambitious programme, there was no clear recognition of the need to build engineering capacity to be able to achieve the objectives. It therefore did not provide for the deliberate and systematic development of the engineering and construction industry in Nigeria. The policy thrust continued to be the import substitution strategy. Most of the industries that were being established depended wholly on foreign experts, foreign technology and continuing import of foreign input for operations. Engineering in Nigeria was reduced to a collection of assembly plants with very little local value added.

Although it patronised local engineers for infrastructure provision, they were not considered as strategic assets in the plans, and foreign contractors were also generously patronised. Indeed, local contractors were considered incapable of managing the more grandiose projects and were only awarded the minor ones. Patronising local consultants was often perceived as a favour.

The military increasingly neglected the development of indigenous contractors on the grounds of inexperience and slow pace of work, generally preferring to work with foreign firms. Foreign firms, on the other hand, were quick to take advantage of this situation and offered foreign travel opportunities, assistance with children education and outright bribery as incentives. Foreign governments and their trade missions, with more resources, know-how and easier access to the ruling elites, encouraged and supported both parties. Diplomatic pressures and coercion might even have been employed.

The indigenous contractors had little chance of winning the competition against the foreign contractors supported by the government and the civil service. The few indigenous contractors who had risen to the highest class could not survive the new competition. By the time of the fall in oil prices, there were no serious indigenous players among the first class contractors in the country anymore.

In the case of engineering consultants, the Federal Ministry of Works and Housing had a lot of projects to execute under the Third National Development Plan, and initially adopted a more positive attitude to the use of Nigerian consultants. The Ministry of Works adopted the approach of partnering Nigerian consultants with the more experienced foreign counterparts, which allowed the acquisition of experience and competence. The Federal Capital Development Authority (FCDA) adopted this policy in the development of Abuja in its early development

period. This was, however, not a recognition of the need to develop local capacity as strategic economic asset. The oil industry was particularly conspicuous for ignoring indigenous consultants and contractors altogether and fully sourcing these services from abroad.

Thus, by the end of the 2nd National Development period, there were quite a few competent indigenous consulting firms able to carry out projects of above average complexity and with staff strengths of a hundred and above. However, there were no longer wholly indigenous contracting firms in the highest category of contractors, having been displaced by their foreign counterparts.

Fourth National Development Plan 1980 - 1985

The Shehu Shagari administration completed the implementation of the Third National Development Plan and formulated and started the implementation of the Fourth National Development Plan, which was to last from 1980 to 1985. This Plan was different from the previous two plans in that it was prepared by a civilian administration and enjoyed wider consultation and diversity of input in its development. It assumed that the oil boom would continue and budgeted an expenditure of =N=82 billion, compared with =N=53 billion in the previous plan. Not having realised most of the objectives of the previous plans, the objectives of the fourth plan were not significantly different. The socio-economic situation was, however, significantly different.

According to Ikpeze et al.,

> *The experience of the 1980s amply underscores the impact of the objective conditions of an economy on the policy choice. If the oil boom of the 1970s induced and nurtured a statist, command-planning policy regime, the failures of that regime as well as the objective conditions of the 1980s foisted a necessity for fundamental reforms.*
>
> *1982 signified the end of an era, with the collapse of the international oil market. With this collapse, Nigeria's structural defects, which had been papered over by the oil boom, came to the fore. Foreign exchange difficulties became acute, and the entire manufacturing sector (based on ISI strategy and heavy dependence on imported inputs) was in serious trouble. The manufacturing sector still manifested a litany of problems such as concentration on the light and elementary industrial groups, low local value-added; high import intensity, negligible contribution from the engineering industry groups, poorly developed local inter- and intra-linkages, low technology activities, limited employment effects, regional agglomeration of concentration at the Lagos-Ibadan (South-West), Jos-Kano-Kaduna (North) and the Onitsha-Nnewi-Aba (South-East) axis, poor export performance, dualism, without any tendency for small-scale and informal-sector enterprises to upgrade, and undue government involvement, especially in heavy industry (Oesterdiekhoff, 1991).*

It is not clear that the architects of the Fourth National Development Plan understood this situation enough, and if they did, adequately planned for it. The emergent political class consisted of former military leaders, ministers, commissioners and senior civil servants under them, and the private sector business leaders that had grown under their tutelage. Private interest in the accumulation of material assets was the underlying objective of most policies and actions.

The same policies of large-scale government investments in infrastructures and industries using foreign expertise, technology and resources, sometimes with Nigerian fronts continued. Increasingly, it became difficult for Nigerian contractors and consultants to compete, while foreign contractors and consultants thrived. Technologically, manufacturing was never in the hands of Nigerians, especially at the shop floors. Even the ownership at board levels was mostly pretentious and essentially self-seeking. Large boards of company appointed by government continued to milk the system. With the drying up of the oil boom, there was not much to milk and most of the industries collapsed. Nigerian Shipping Lines sold all its ships. Nigerian Airways sold all its planes. The railway system ran aground. The list is endless.

Indigenous and foreign consultants continued to play active and substantial role in the implementation of the projects under the plans during this administration. Indigenous contractors remained marginalised and the skill and capital gap between them and their foreign counterparts widened even more.

Structural Adjustment Programme, SAP 1985 - 1992

The Shagari administration was overthrown by a military coup d'etat in December 1983 and General Mohammadu Buhari became the Head of State, but he was soon overthrown by another coup in 1985 and

General Ibrahim Babangida became the Head of State. These military administrations were not interested in National Development Plans of known duration and content. In the wake of the fall in oil prices, Nigeria could no longer meet its external financial obligations. Having established industries that were import dependent for machines, spare parts and raw materials, most of the industries could not function. The international financial institutions froze credit to Nigeria. The International Monetary Fund, IMF, prescribed structural adjustment packages for Nigeria, as for several other countries in the same situation. In response to the severe distress being faced by the Nigerian economy at the time, the Babangida administration introduced the Structural Adjustment Programme, SAP.

According to Ikpeze et al., the key objectives of SAP with respect to industrial policy were to:

- encourage the accelerated development and use of local raw materials and intermediate inputs rather than depend on imported ones;
- develop and utilise local technology;
- maximise the growth in value-added of manufacturing activity;
- promote export-oriented industries;
- generate employment through the encouragement of private-sector small and medium-scale industries;
- remove bottlenecks and constraints that hamper industrial development, including infrastructural, manpower and administrative deficiencies; and
- liberalise controls to facilitate indigenous and foreign investment (Federal Republic of Nigeria, 1986).

While the intellectual force of ISI strategy essentially drove the old policy regime, the new regime foisted by the SAP agenda favoured a "no industrial policy" and a liberal trade regime.

SAP did not, however, have a strategy for industrial development. Rather, it sought to provide a free atmosphere that would encourage manufacturing and industrialisation. There was some sense of success initially, as the manufacturing component of the nation's GDP went up in the late 1980s. But this did not endure. For a developing nation with poor infrastructure and orientation, a laissez-faire approach would definitely not lead to the desired results. A more robust strategy was required.

Ikpeze et al. again:

> *If the dismal performance of the manufacturing sector under the ISI strategy necessitated a fundamental change of policy, the outcomes under the new policy regime have not been better. Since the 1990s, manufacturing value added as a share of GDP has stagnated, and as at 2000 was 4.9 percent of GDP (less than the 5.3 percent at independence in 1960). Capacity utilisation has remained at around 35 percent, and manufacturing employment has declined, despite the fact that raw materials and capital goods imports gulp about 60 percent of Nigeria's foreign exchange earnings.*

Perhaps it was the frustration with the failures of the old industrial policy as a patchwork of ad-hoc measures that informed the need to systematically articulate a comprehensive industrial policy. In 1989, the Babangida government launched the first formal Industrial Policy of Nigeria, and in 1990, the first Trade Policy was also launched. These policy documents have also been revised — industrial policy in 1998, and 2001, and trade policy in 2000 and 2001. With the political turmoil that ensued from the early nineties, these policies were not implemented and industrialisation continued to lack focus and strategy.

National Construction Policy (1991)

In May 1991, the then Federal Military Government launched the National Construction Policy. The policy focused on the role that the construction industry could play in national development. Desirable goals and objectives were set out and the inadequacies of the condition of the construction industry identified. It noted that the dominance of the industry by multinational companies had many economic disadvantages for the country, including the outflow of foreign exchange, dependency on foreign companies, development of foreigners, high cost of infrastructures and poor national image, among others. The most important means of achieving the desired goals and rectifying the shortcomings were identified as self-reliance in terms of developing indigenous construction companies and consultants.

Some of the relevant specific clauses of the policy are as follows:

> 1.3 Generally, the construction industry is a potent motivator of the national economy, providing the driving force necessary for either sustaining a buoyant economy or reviving a depressed one.

> Many developed countries have successfully revived their national economies by maintaining high level of activities in the construction industry...
>
> In the developed economies, construction capability is a potent export commodity, bringing foreign exchange earning and national respect.
>
> 1.4 On the other hand, in the developing countries where construction capabilities of the advanced countries manifest as multinational construction firms, the only "gains" accruable are packaged products with little or no local value added, except in cases where such developing countries pursue aggressive policies of acquiring the necessary technological and managerial skills required by the industry.
>
> 2.3(i) Government should utilise the catalyst effect of high level of activity in the construction industry to maintain the national economy on a high level.
>
> (vii) Government should redirect its policies in the award of construction and consultancy contracts in favour of the indigenous sector so as to establish, nurture and sustain indigenous capability in the construction industry.

However the Policy lacked an implementation strategy, consequently it has remained ineffective till date. According to an unconfirmed source:

> *In Nigeria, the construction industry was the dominant contributor to the nation's GDP in the 1980s, accounting for about 70% of the GDP (Planning Committee on the National Construction Policy, 1989). This made the industry very strategic to Nigeria's development efforts. Unfortunately, however, the industry has been bedevilled by a combination of low demand and consistent low productivity and poor performance over the years (Olomolaiye, 1987; Aniekwu, 1995; Okuwoga, 1998; Adeyemi et al.; 2005). This has reduced its contribution to the national economy to a mere 1% of the GDP by 2002 (AfDB/OECD, 2004).*

The industry is made up of an organised formal sector and an unorganised informal sector. The formal sector comprises mostly foreign and indigenous companies, which are classified into small, medium and large scale according to their level of capitalisation and annual turnover. The few large firms (mostly foreign), which constitute just about 5% of the total number of contractors in the formal sector, control about 95% of the construction market, giving the small firms just about 5% share of the market.

Petroleum (Special Trust Fund) (1996 – 1999)

In June 1993, there was a brief interlude in the Second Military Era when Ernest Shonekan's Civilian Interim Administration took over from General Babangida but General Abacha soon restored the military. The Abacha administration set up the Petroleum Trust Fund by increasing the retail prices of petroleum products and crediting most of the increase to the Fund. Most of the Fund's resources were to be devoted to Highway projects in part because of the source of the fund. Many engineering consultants were involved in the implementation of the projects and this led to a revival of engineering consultancy but far from the level reached during the implementation of National Development Plans. Although this effort provided some succour for the construction industry, it was another ad-hoc effort without strategic plans and was aborted by the successor regime of Olusegun Obasanjo.

New Partnership for African Development, NEPAD (2003 – Present)

According to a NEPAD 2001 publication, the New Partnership for African Development, NEPAD, is the initiative of African Heads of States to come up with a solution to the myriads of problems confronting the African continent. It is a holistic, comprehensive and integrated strategic framework for the socio-economic development of Africa. Its primary objective is to eradicate poverty in Africa and to place African countries, both individually and collectively, on the path of sustainable growth and development to thus halt the marginalisation of Africa in the globalisation process.

The priorities for the NEPAD Action Plan are as follows:

- Peace & Security
- Democracy, political economic and corporate governance (with a focus on public financial management)
- Regional co-operation and integration
- Capacity building (at country, regional levels)

The priority sectors are:

- Agriculture (go beyond primary production to look at beneficiation and agribusiness Africans have not been innovative and looked at agriculture in an integrated way).
- Human Development (Health and Education)
- Building and improving infrastructure
- Promoting diversification
- Accelerating intra-Africa trade and improving access to the markets
- The environment
- Resource Flows; and
- Infrastructure (ICT, Energy, water and sanitation, and transport)

NEPAD is perhaps the most comprehensive and strategic attempt to plan development, albeit at the continental level. Implementing the NEPAD programme has, however, been slow and challenging. Much of the financing was to come from outside Africa, and this has been slow in coming. NEPAD does not, however, pretend to be a national development plan, and each state is still expected to develop its own internal plans.

National Economic Empowerment & Development Strategy, NEEDS (2004 – 2007)

The administration of Obasanjo introduced NEEDS as its development strategy at the start of his second term. Cascading down to states and local governments were the equivalent SEEDS and LEEDS. The programme was based on four key strategies: reforming the way government worked and its institutions; growing the private sector; implementing a social charter for the people; and re-orientation of the people with an enduring African value system.

Reforming Government and Institutions: The goal was to restructure and strengthen government and public institutions to deliver effective services to the people. It aimed to eliminate waste and inefficiency, and free up resources for investment in infrastructure and social services by Government. A key aspect of the institutional reforms was to fight corruption, ensure greater transparency, and promote rule of law and stricter enforcement of contracts. Considerable energy was put into this, and significant progress was made.

Growing the private sector: NEEDS was anchored on the private sector as the engine of growth for wealth creation, employment generation and poverty reduction. The government would be the enabler, the facilitator, and the regulator. The private sector would be the executor, the direct investor and manager of businesses. The key elements of this strategy included renewed privatization, de-regulation and liberalization programme (to shrink the domain of the public sector and buoy up the private sector); infrastructure development especially electricity and transport; explicit sectoral strategies for agriculture, industry/ SMEs; services (especially tourism, art and culture, and information/ communication technology), oil and gas, and solid minerals.

This policy objective did not cascade to specific action plans. Growing the private sector should have translated to imparting technical and business skills and facilitating the establishment of small and medium scale enterprises. Apart from the provision of financial institutions for borrowing, there were no aggressive programmes for skill acquisitions and supports for the promotion of the businesses.

Indeed, this policy should have had the development of the construction and manufacturing industries across all scales as part of its focus for the growth of the private sector. It did not, and only access to finance was addressed and even this did not reach most of those who needed it.

Implementing a social charter: NEEDS was about people: their welfare, health, education, employment, poverty-reduction, empowerment, security and participation. Without productivity, social charter was limited to government largesse, and consequently severely limited. The concept of sharing national cake and demanding that government provides for everybody continued to prevail. Of course, the governments could not cope and not much progress was made.

Value Reorientation: Public sector reforms would aim to emphasise professionalism, selfless service, and efficiency (value-for-money). The anti-corruption measures, fight against the advance fee fraudsters, and strive towards greater transparency in public and private sector financial transactions would help to ensure accountability, and send the message that those who make money through illegal and illegitimate means have no hiding place.

While a lot of effort was put into fighting corruption, improvement in

professionalism, selfless service and efficiency could really not be said to have been addressed, and much of it is still lacking in the society.

The indigenous construction industry had no specific role in the strategy and its critical role in the actualisation of most of its objectives was not appreciated. Instead, most of the strategic projects in the period were contracted out to foreign companies. The new entrants into the game, the Chinese, had their choices of just about any projects in the country, from roads and highways to railways and water supply projects. The Chinese often came with a total package, the whole of the design done in China by Chinese companies, the labour force, sometimes including gatemen and security staff imported wholly from China.

Nigerian consultants and contractors were fully marginalised in this period. The consequence was continuous deterioration of the sector.

Nigerian Content Policy in the Oil & Gas Sector (2005)

Despite huge investments made by the Federal Government of Nigeria in the oil and gas sector of the economy, an average of US$10 billion per annum, its contribution to GDP growth has been minimal. This is largely due to low local content in the industry, evident from the over 90% of work value carried out abroad. This has led to a dearth in jobs, skills development, capacity building, capacity utilisation and sustained national economic development.

Nigerian Content is the quantum of composite value added or created in the Nigerian economy through the utilisation of Nigerian human and material resources for the provision of goods and services to the petroleum industry within acceptable quality, health, safety and environment standards in order to stimulate the development of indigenous capabilities.

To address the situation, the Federal Government set Nigerian Content targets for the oil and gas industry of 45% by 2006 and 70% by 2010 respectively. In addition, presidential directives were issued with the aim of domesticating a significant portion of economic derivatives from the oil and gas industry.

However, the dearth of competence that has resulted from the lack of patronage of local professionals over the years did not help matters, and the realisation of the objectives of the policy remains difficult. A few firms have, emerged and are playing active roles in the industry. There is, however, much more to be done to further break down the barrier to local participation in the industry.

Public Procurement Act 2007

The Obasanjo administration also promoted the National Procurement Policy. The major objective of this policy was, however, the reduction of corruption and adoption of due process in the procurement of goods and services in the country. It did not have any specific objective of developing the construction industry.

Seven-Point Agenda (2007)

President Umar Yar'Adua came up with the Seven-Point Agenda to drive the policy of his administration. The main thrusts of this agenda are as follows:

Power and Energy – The infrastructural reforms in this critical sector through the development of sufficient and adequate power supply will be to ensure Nigeria's ability to develop as a modern economy and an industrial nation by the year 2015.

Food Security – This reform is primarily agrarian based. The emphasis on the development of modern technology, research, financial injection into research, production and development of agricultural inputs will revolutionalise the agricultural sector leading to a 5 – 10 fold increase in yield and production. This will result in massive domestic and commercial outputs and technological knowledge transfer to farmers.

Wealth Creation – By virtue of its reliance on revenue from non-renewal oil, Nigeria has yet to develop industrially. This reform is focused on wealth creation through diversified production especially in the agricultural and solid mineral sector. This requires Nigerians to choose to work, as hard work by all is required to achieve this reform.

Transport Sector – The transportation sector in Nigeria with its poor roads networks is an inefficient means of mass transit of people and goods. With a goal of a modernised, industrialised Nigeria, it is mandatory that Nigeria develops its transport sector. The PDP government has already started this process by the ongoing rehabilitation and modernization of the railway. While the

reforms might take some time to take effect, it is a need that must be addressed.

Land Reforms – While hundreds of billions of dollars have been lost through unused government-owned landed asset, changes in the land laws and the emergence of land reforms will optimize Nigeria's growth through the release of lands for commercialised farming and other large-scale business by the private sector. The final result will ensure improvements and boosts to the production and wealth creation initiatives.

Security – An unfriendly security climate precludes both external and internal investment into the nation. Thus, security will be seen as not only a constitutional requirement but also as a necessary infrastructure for the development of a modern Nigerian economy. With its particular needs, the Niger Delta security issue will be the primary focus, marshalled not with physical policing or military security, but through honest and accurate dialogue between the people and the Federal Government.

Education – The two-fold reforms in the educational sector will ensure firstly the minimum acceptable international standards of education for all. With that achieved, a strategic educational development plan will ensure excellence in both the tutoring and learning of skills in science and technology by students who will be seen as the future innovators and industrialists of Nigeria. This reform will be achieved through massive injection into the Education sector.

Leadership of Federal Ministry of Works

A major indicator of the policy and strategic thrust of an organisation may also be discerned by the choice of leadership of such organisation. In the years since independence, an examination of the leadership of engineering-driven ministries and parastatals reveals a compelling randomness and lack of any strategic or policy thrust. This is typified by the Federal Ministry of Works, but is also true of the ministries responsible for water resources and power development.

The first post-independence minister of works was Alhaji Inuwa Wada, who held the position from 1955 to 1965, a period of ten years, five of which were before independence. Immediately after him was Alhaji Shehu Shagari who held the position briefly before passing it on to Alhaji Femi Okunnu who held the post for seven years, three of which were war years and the remaining four immediate post-war period. These tenures were long enough for the leadership to understand the challenges of the sector, lead the formulation of appropriate strategies and policies, and make progress in implementation. Inuwa Wada had the First National Development Plan, 1962 – 1968 to work with, while Femi Okunnu had the civil war and the Second National Development Plan, 1970 – 1974 to drive infrastructural development. The only other decent tenure that could be found in the records was that of Major General Kontagora who led the ministry for about six years from 1987 to 1993. Most of the other occupants of this position were there for less than two years. This is hardly enough time for any leader to understand the challenges of the sector, talk less of developing strategies to address them.

The problem of short tenures might have been less if there were development plans to drive the provision of infrastructures. After the Third National Development Plan (1975 – 80), successive governments abandoned the development plan approach to national development and substituted it with more subjective and less measurable approaches. Periodic development plans were sometimes substituted with longer-term visioning, such as the vision 2010 and 2020 projects. There were also frequent changes in policy from one administration to the other, resulting in the lack of clear direction. Even from Obasanjo to Yar'Adua, we have had to move from NEEDS to the Seven-Point Agenda.

Finally, and perhaps most importantly, the ministers were mostly political appointees with no engineering qualification, experience or exposure. It is difficult to imagine how they could, in their very short tenures and without clear strategy, understand the challenges of the industry and respond to this. From the engineers' perspectives, this is perhaps the most painful and least understood practice in the management of the engineering industry in Nigeria – treating it totally as a political post with no recognition for professionalism. Even COREN, which is the engineering regulation agency in the country, reports to this minister.

The consequences of this anomaly is that the civil servants have, on the one hand, enjoyed professional leadership in the running of the affairs of the ministry; and on the other hand, often been hindered by strictly political decisions that they had to abide by because the ministers did not understand the industry. One of such major decisions was the policy

Table 14 Ministers of Works in Nigeria (1955 – 2009)

Minister	Tenure	Duration	Profession
1. Alhaji Tafawa Balewa	1955	1	Politician
2. Alhaji Inuwa Wada	1955--1965	10	Politician
3. Alhaji Shehu Shagari	1965--1966	1	Politician
4. Alhaji Femi Okunnu	1967--1974	7	Lawyer
5. General Olusegun Obasanjo	Jan - June 1975	1	Military
6. Commander Olumide	Jul 1975--1976	1	Military
7. Major Gen O.E.Obada	1976 -- 1977	1	Military
8. Mr Oberu Aribia	1977--1978	1	
9. Major Gen Mohammadu Shuwa	1978--June 1979	1	Military
10. Mr. Victor Mazi	1979 -- 1981	2	
11. Mr. Wahab Dosumu	1980-- 1982	2	Town Planner
12. Mr. Sunday Esang	1981 --1983	2	
13. Mr. I. Igbani	1983--1984	1	
14. Alhaji Yerima Abdulahi	1984--1985	1	
15. Dr. E.N.Nsan	1984	1	Medical Doctor
16. Air Commodore H. Abdulahi	1985--1986	1	Military
17. Alhaji Abubakar Umar	1986--1987	1	
18. Maj Gen M.T. Kontagora	1987-- 1993	6	Military
19. Engr B.A. Gemade	Jan-- Nov 1993	1	
20. Alhaji Lateef Jakande	Nov 1993 -- Feb 1995	1.5	Politician
21. Maj Gen Kareem Adisa	Feb 1995-- Dec 1997	2	Military
22. Maj Gen Alli Mohammed	Jan 1998-- May 1999.	1.5	Military
23. Chief Tony Annineh	Jun 1999-- Nov 2002.	3.5	Politician
24. Chief Madaki Alli	Nov 2002 -- May 2003.	1	
25. Senator Adeseye Ogunlewe .	July 2003 --Mar 2006	3	Politician/Lawyer
26. Dr. Obafemi Anibaba	Mar 2006 -- Sept 2007	1.5	Civil Service/Engineer
27. Chief Cornelius Adebayo	Nov 2006		
28 Dr. Hassan Lawal	2007-- date		Politician/Lawyer

Source: Fed Min of Works Abuja.

of not using consultants for the design of highways in the country and giving it turnkey to contractors. The consequence huge variations in scope and cost of the projects were an embarrassment to the industry.

Millennium Development Goals and targets (1990 – 2015)

The United Nation Development Programme, UNDP, in response to the challenges of underdeveloped countries of Africa and South East Asia, came up with the Millennium Development Goals which set targets for these countries to achieve by the year 2015. This has been discussed in numerous literatures and will not be repeated here. It is, however, important to note that this is not a development plan, but an intervention to improve the lot of the poorest in the society. In concept and execution, it is not expected to do more than that.

The above list summarises the major policy thrusts that address engineering development in the country since independence. On the whole, they remain inadequate, incoherent and inconsistent and cannot be said to provide an environment for the growth of the industry.

CHAPTER 14

CHALLENGES OF DEVELOPMENT

Images: Engineering in Development

Image above: Complex Road Transportation. Source: iStock

Images opposite
Top left: Aeropace Travels. Source: iStock
Middle: Water treatment plant. Source: iStock
Bottom: Power Transmission Lines. Source: iStock

One of the major purposes of history must be for people to understand how the seemingly discreet and independent events of the past explain why things are the way they are today, and with this understanding, hopefully, predict and better manage the future. The historical and contemporary political, economic and social events in the world have direct impacts on engineering development, as indeed on all other developments. Engineering is, however, peculiar in that it provides the solutions to those developments that are dependent on our understanding of the basic forces of nature.

The issues discussed here are in two broad groups. The first group consists of the issues that are critical to national development in Nigeria and must be urgently attended to by the national government, while the second group consists of the global issues that the totality of humanity, of which Nigerians are a part, must address.

The strategies and frameworks that have been used in the past to address national development in Nigeria have been discussed in previous chapters and include the National Development Plans, the National Economic Empowerment Development Strategy, NEEDS, under Obasanjo, the Seven-Point Agenda of Yar'Adua, the Millennium Development Goals developed by the United Nations Development Programme, UNDP, and the goals enunciated by the New Partnership for African Development, NEPAD. These strategies and frameworks did not appear to comprehensively and holistically address the challenges of development in Nigeria and fell short in several ways.

National Development Planning Framework

In the development of the Regional Plan for Ogun State, the consultants, Comprehensive Project Management Services Limited, developed a framework for regional development planning. This framework identified key areas that must be strategically addressed for the holistic and comprehensive development of a region. The seven key areas identified were further broken down into twenty-three component parts as shown in Table 15.

When the strategies and framework that have been adopted in the past or currently proposed are evaluated against the CPMS framework, several gaps appear, suggesting the inadequacy of these strategies and frameworks to holistically address the issues of national development.

Table 15 Framework for Development Planning

1 Population
- Population Growth
- Migration

2 Landuse
- Ownership & Tenure
- Land Use Plan

3 Economy
- Agriculture
- Manufacturing
- Construction
- Mining
- Trading
- Hospitality & Tourism

4 Physical Infrastructure
- Transportation
- Power
- Water Supply
- Environmental Management
- Information & Communication Technology

5 Social Infrastructure
- Education
- Health Care
- Housing
- Sports & Recreation

6 Human Capital Development
- Orientation
- Continuous Development

7 Peace, Security, Law & Order
- Good Governance
- Rule of Law

NEEDS addressed only four of the seven broad areas. It did not address Population, Land Use and Physical Infrastructures directly. Although the government spent huge sums of money on power and transportation, and significantly improved ICT, these were not within the framework provided by NEEDS.

The provisions in the four areas directly addressed by NEEDS - Economy, Social Infrastructures, Human Capital Development, and Peace, Law and Order - were very general and did not constitute strategies. At best they were expressions of interests. While the government actively addressed the secondary economic factors such as banking and insurance, the primary sectors of production, especially manufacturing and construction, had no clear strategies for their development. Indeed, the policy on construction appeared to be the dominant use of foreign contractors, especially Chinese firms.

The Seven-Point Agenda did not address two sectors at all, Population and Human Capital Development. In the five sectors addressed, the provisions were very general and often did not cover several of the critical sub-sectors. Under Physical Infrastructures, only power and transportation are provided for; there were no provisions for

water, environment and ICT. Economic Infrastructure mentioned only food security and wealth creation; no specific provisions for the productive sectors including construction and manufacturing. Social Infrastructure had only education; there were no provisions for health, housing and sports and recreation. Only security was mentioned under Peace, Law & Order.

It is clear that the governments that promoted NEEDS and the Seven-Point Agenda had programmes that attempted to cover all areas of development. The point being made here is that they were not carried out within a viable strategic framework. Indeed, some of their most successful achievements were not covered by their branded plans.

A critical evaluation of the Millennium Development Goals shows that it is indeed not a strategic development plan, but the minimum standards that should be met by a certain time. It did not directly address Population and Land Use. Under Physical Infrastructures, it addressed only environmental sustainability. Under Economic Infrastructure, it only aimed to eradicate extreme poverty and hunger. In education, it aimed to achieve universal primary education. Its provision for health was the most ambitious, covering the major endemic diseases including malaria, HIV Aids, and infant and maternal mortality. Important as these goals are, they cannot be the basis for national development planning.

The final framework considered is the NEPAD framework. This is perhaps the most ambitious of the four frameworks. It addressed five of the seven main sectors, leaving out Population and Land Use. It mentioned all the five sectors of the Physical Infrastructures. Under Economic Infrastructure, it mentioned agriculture and trade but left out manufacturing and construction, two key areas. Under Social Infrastructures, it addressed health and education, leaving out housing and sports and recreation. Its provision for Human Capital Development was essentially capacity building. Peace, Law and order had a comprehensive provision. On the whole, NEPAD provisions perhaps provided the best framework of the four considered on which each nation in Africa can build its own development plan.

Development Challenges

The developmental challenges facing Nigeria in each of the sub-sectors are briefly addressed below.

Population Management

It is a shame that we, as a nation, do not know within an acceptable degree of confidence, how many we are. Our censuses have remained controversial, with each state, local government, and even towns, claiming populations as they desire. The fact is that technology has moved beyond this point, and we should be able to determine, with good accuracy, how many we are. Our spatial distribution and demographics should also be correct and accurate. It is when we have good base data that we can make projections for the future. This is the beginning of any meaningful planning. We also have to keep good records of movement of people so as to be able to plan for them.

Land Use Management

Our land ownership and holding tenures are confused and not responsive to our development. The law says that the state governor is the custodian of all the land in the state he governs. In practice, however, multiple payments have to be made to the state government and several other parties claiming ownership. The process is confusing, tedious and often threatening to lives.

The lack of regional, country and town planning has resulted in environmental squalor. We need to have plans at the country, state, local government and township levels that are well integrated. These plans will need to build on the population data, physical characteristics of the land as well as our developmental objectives.

Economic Development

The strategy for economic development must be hinged on developing capacity and capability across a broad sector of economic activities. We have primary advantages in agriculture and mining by virtue of what nature has endowed us with. We have, however, not been able to develop ourselves to take full advantage of these. Our agricultural products remain primary products with very low value added. Our mines are explored and exploited only by foreign experts and expertise. These will not lead to economic development.

Table 16: Analysis of Development Plans Against CPMS Planning Template

DEVELOPMENT PLANNING FRAMEWORK	DEVELOPMENT SECTORS	NATIONAL PROGRAMMES		GLOBAL PROGRAM	AFRICAN PROGRAMME
		NEEDS	7 POINT AGENDA	MILLENNIUM DEVELOPMENT GOALS	NEPAD
Population	Population Growth Migration				
Land Use	Ownership & Tenure Land Use Plan		Land Reforms		
Physical Infrastructure	Transportation Power Supply Water Supply Environment ICT		Transport Sector Power & Energy	• Ensure environmental sustainability	• Building and improving infrastructure • Infrastructure (ICT, Energy, water and sanitation, and transport) • The environment
Economic Infrastructure	Agriculture Manufacturing Mining Construction Trading Hospitality & Tourism	Growing the Private Sector	Food Security Wealth Creation	• Eradicate extreme poverty and hunger	• Agriculture • Promoting diversification - Accelerating intra-Africa trade and improving access to the markets • Resource Flows
Social Infrastructures	Education Health Care Housing Sports & Recreation	Implementing a Social Charter	Education	• Achieve universal primary education • Reduce child mortality • Improve maternal health • Combat HIV/AIDS, malaria and other diseases	
Human Capital Development	Orientation Life Time Engagement	Re-Orientation of the People		• Promote gender equality and empower women	• Capacity building (at country, regional levels)
Good Governance, Peace, Law & Order	Good Governance Rule of Law	Reforming the way Government Works	Security	• Develop a global partnership for development	• Peace & Security • Democracy, political economic and corporate governance (with a focus on public financial management) • Regional co-operation and integration

Manufacturing and Construction provide level playing fields in which every nation can compete. Of course, some have initial advantages having started far ahead of others. Their manufacturing and construction capabilities are used not only to produce new products and services, but to enhance the values of agricultural and mining products. Unless we acquire competence, capacity and capabilities in these two fields, we delude ourselves if we think there will be any meaningful development. We must produce most of the things we use and consume; our food, our clothes, cars, homes, utilities and all; we must produce as much of them as possible as a matter of policy. The name of the game is production.

Secondary economic activities, including tourism, banking and finance only come on the heels of the primary products. The only reason we appear to be doing well in these sectors today is because of the primary products, petroleum and gas. These are not only finite products, their extraction and production is not in our hands. Even social facilities including education, health and housing, can only thrive if economic production is viable.

Our economic base must include primary production in agriculture, manufacturing and construction. If we master these, secondary economic activities will thrive.

Provision of Physical Infrastructure

There are five main physical infrastructures in the world today. These are transportation, water supply, power supply, waste management and information and communication technology, ICT. There is really no way any country is going to develop without any of them. Transportation is perhaps the biggest, and is further divided into roads, rails, air, sea and piped transport.

The country is today in short supply of all these infrastructures. Road transport is inadequate and in poor condition with frequent deaths on our roads. Nigeria spent billions of Naira in the seventies and eighties to create a large and good quality network of roads and highways. Neglect through poor maintenance culture and lack of additional roads have resulted in a very poor and unsafe road network. The consequences of these to the quality of life are self-evident in the travel times, life span of vehicles and the high degree of inconvenience to citizens. The Nigerian Railway system has not seen any development in over forty years. The effect of this is to put severe pressure on the road network resulting in congested highways and pavement failures. Nigerian waterways remain undeveloped. Inland waterways are underdeveloped, and remain a promise not kept by successive administrations, and our seaports are grossly inefficient. Air transport is dominated by foreign airlines.

Less than 40% of the citizens have access to power. In a country that could use 200 Megawatts of power, we have installed capacity of less than 10 Megawatts, and production is often less than 2 Megawatts. After years of neglect, even the last ten years of intense attention to power supply has not resulted in improved power supply. Somehow, either the strategy or the implementation procedures, or indeed both of them, have been unable to make any change in the situation. The cost of this in the quality of life, productivity of industries and work places, national image and self-esteem of citizens is very severe.

We are unable to manage our wastes, with solid, liquid and gaseous wastes polluting our environment. We understand that only about 40% of the country has access to clean water.

There is a saving grace in ICT, with significant improvement in our tele-density, and increasing use of computers and the internet.

There is something fundamentally wrong in our total dependence on foreign expertise, advice, manufacture, construction and management of these facilities. It just will not work as we would be unable to pay the economic and social price of this dependence. The strategic solution is to develop local competence, capabilities and capacity rapidly. Other nations have done it in the period we have been floundering about.

Provision of Social Infrastructure

Social infrastructures are addressed in four broad sectors of Education, Health Care, Housing and Sports and Recreation. Together with physical infrastructures, they impact on people's lives on a daily basis.

Education is the foundation of all developments. It is a well-established fact that education is the critical panacea to most of the backwardness of developing countries. High literacy level ensures that basic information can reach most people, and knowledge can be acquired just for the asking. A critical goal is thus to ensure that the whole population can read and write. Nigeria is still under pressure to ensure adequate infrastructure for the provision of basic education.

Preventable diseases are still very prevalent in our country, diseases that can be easily prevented by good water and sanitation, both of which are grossly lacking. From malaria to dysentery, from AIDS to tuberculosis, preventable diseases are still prevalent. In addition, modern health care for non-preventable diseases is grossly inadequate. Infant and maternal mortality in Nigeria are reported to be among the highest in the world. Drugs are required for treatment. Without manufacturing capabilities, these drugs have to be imported from abroad. And when attempts are made to manufacture these locally, the equipment, technology and management also have to be imported, resulting in high cost and not much impact on local employment. The already poor populace then uses even the little that it has on health care, rather than on growth and development.

Housing continues to be a major problem in the country, with difficult access to land, high cost of construction, long construction period and inability to pay by the general populace. The result is that only the affluent, who constitute less than five percent of the total population, have access to decent housing. As a matter of policy and strategy, housing must be provided for all cadres of people in the society within the resources of that society. This requires the integration of population and demographic data with land use planning, and with manufacturing and construction to produce appropriate and affordable houses. The present situation where we are dependent mostly on imported building construction materials is just not sustainable.

Sport is perhaps the greatest social mobilisation and integration factor in the world today. A successful sporting culture helps to mobilise and integrate people at school, city, state, national and global levels. Those who take direct active part in it as players and promoters derive their livelihood from it. Those who watch sports derive recreation from it and can become extremely passionate about it. Societies can forget their differences and unite behind their teams when it comes to sports. The contribution of sports and recreation to the physical, social and economic well-being of people has been well documented. A national sports and recreation strategy is critical.

Human Capital Development

By their productive activities, people create the wealth in any society. Development can therefore only be achieved by a society that has mastered the art of mobilising and developing its citizenry for efficient productive and activities. The outcome would then be improved quality of lives in all its ramifications.

Nigeria often ranks very poorly in human development assessment in the world. She ranked 159 out of 177 countries surveyed for the UN Human Development Index (HDI) 2006. In addition to the GDP, other parameters measured in the survey include life expectancy, adult literacy and enrolment at the primary, secondary and tertiary institutions, and income and purchasing power parity, PPP.

There is a critical need for the preparation of a robust human capital development strategy for the nation that seeks to provide maximum opportunity for the individual and collective development of our human capital throughout their lives.

Good Governance, Law and Order, Peace and Security

Good governance, law and order, meaningful engagement and prosperity promote peace and security. The six main sectors of national planning discussed above directly address the area of meaningful engagement and prosperity. This final section addresses good governance and the rule of law.

The challenge with governance is not so much with the ideology or constitution with which we are governed as with the honesty of those who lead us, the fairness in the interpretation and implementation of the various clauses of our constitution, and the application of the rule of law to call erring parties to order. Our elections have been driven, not by issues and policies that would develop and unite us, but by greed, corruption and the exploitation of ethnic and religious differences which should otherwise have been our strength.

The strategic objective is how to move away from these negative and divisive factors that continue to pull us down to the positive and unifying factors that would lead to progress.

Global Challenges

Some specific examples of national and global challenges for which engineering and technology must provide strategic solutions are as follows.

Population Explosion

One of the most challenging problems in the world today is the continuous increase in population. Just over fifty years ago, the population of the world was only two billion people. Today, it is estimated to be over 6 billion, a three-fold increase. It is projected to rise to over 10 billion in the next thirty years. This huge increase in population is putting severe pressures on planet earth and its resources. More urban centres are emerging, demand for food, energy, water and all the critical elements for survival is increasing, and there is the need to respond to this development. While sociology addresses the issues surrounding the rate of population increase, science and engineering are challenged to meet the demand of the existing population in housing, water, food, energy, transportation, communication and several other critical needs.

Depletion of Natural Resources

Human activities have severe consequences on the earth. With an increasing population and continuously improving quality of life, the rate at which natural resources are being consumed is now much greater than the natural replacement rates, and the ability of the earth to sustain this level of exploitation is now being questioned. One aspect of environmental management is thus to ensure that natural resources are not exploited beyond the limit of replacement. In this respect, scientists and engineers are increasingly required to come up with more efficient processes for the use of scarce resources, and preferably, produce alternatives that totally avoid the use of such materials. Examples of these include fossil fuel, deforestation, over-fishing and land reclamation.

Management of Toxic Wastes

In addition to the excessive consumption of slow or non-replaceable natural resources, human activities also generate wastes which pollute the natural environment. Solid, liquid and gaseous wastes from industrial and domestic processes contaminate the natural environment leading to the destruction of fauna and flora and altering the composition and natural balance of naturally occurring protective materials. The major causes of this are the industrial production processes of the developed world, burning of fossil fuel through gas flaring, transportation and bush fire. The results have been changes in climate and rising sea levels leading to flooding in some places and desertification in others. Examples of occurrences of this include emission of green house gases leading to ozone layer depletion, generation of toxic wastes from nuclear plants, leachates from solid wastes leading to ground water pollution, The solution to the management of wastes is again fundamentally that of science and engineering,

Coping with Climate Change

There is now confirmatory evidence that the earth is warming up, with severe consequences on the earth as we know it. This temperature rise has been caused by the increase in the amount of greenhouse gases, principally carbon dioxide, released into the atmosphere. These gases form a thick blanket in the atmosphere trapping the sun's heat hence increasing the temperature of the earth. They thereby exhibit a phenomenon called the greenhouse effect, due to the similarity in their reactions in the atmosphere to what obtains in a gardener's greenhouse. This rise in temperature is called global warming and it has dire consequences on the world climate.

A major consequence of this temperature increase is the thawing of the glaciers at the north and south poles, and on mountain tops all over the world. Instead of glaciers that would reflect the rays of the sun and maintain a cooler earth, the resulting melting ice absorbs the heat and causes further temperature rise. The ocean currents and winds have always been means of balancing the temperatures of the world, bringing cold water from the poles to the equator, and warm water from the equator to the poles. The changes in temperature pattern consequently results in changes in ocean currents and a totally new climatic pattern.

In the very recent past, rainfall intensity has increased severely in some areas, and consequently, draughts in others; hurricanes and typhoons have become more common, bush fire is a more regular occurrence, and areas that had not had snow for years are now snowing.

The thawing of the glaciers also results in rising sea level all over the world. All coastal areas are experiencing more frequent incidences of flooding, whether in Asia or the Americas, Africa or Australia. The consequential loss of lives and infrastructure is bound to be catastrophic.

Science and engineering must seek to address these problems as a matter of urgency. Massive reduction in the production of green-house gases is required not only to arrest the situation, but to reverse it. This would require a reassessment of all our infrastructures, especially those that contribute most to the production of green-house gases.

Global Water Supply and Food Production
Another major consequence of global warming is its impact on world water supply. Firstly, settlements that depend on the cyclic freezing of rain water and thawing of ice for their water will no longer have fresh water supply once the glaciers are gone. This would be catastrophic for many cities at the foot of mountains. Secondly, rainfall distribution around the world will change radically. With increasing temperature, more evaporation will take place. With higher humidity and temperatures, heavier precipitation will take place. The problem is that this precipitation will not adhere to the original distribution pattern around the globe. While some areas will have excessive rainfall and consequential flooding, others will be experiencing severe drought. In the last twenty-five years, Lake Chad to the north east of Nigeria has dried up, and Niger and Chad have continued to experience severe drought. In the same period, India has been experiencing record rainfall intensity, and north England experienced flood for the first time in over thirty years.

The prevalence of droughts and floods, hurricanes and typhoons and other severe weather conditions does not favour food production. Already, several countries, mostly the poor ones, are suffering the severe consequences of this with poor harvests and people dying of starvation.

Ensuring Adequate Global Energy Supply
Much of world energy is today provided by fossil fuel. This is a non-renewable material and the total world reserve is estimated to be enough for at most 50 years at the present rate of consumption. The second most used process is nuclear energy, with the challenges of managing the consequential toxic waste.

There is a strong need for the world to seek renewable energy. Alternatives that are being considered include the sea, solar, wind, geo-thermal, biomass, biogas and bioliquid energy sources. Several of these alternatives are at advanced stages of development.

Sea energy includes tidal and wave energy. Tidal energy is in turn composed of tidal streams which use turbines placed at the bottom of the sea to obtain energy from tidal flow, just like wind turbines, and tidal flow devices in which the turbines are floating and derive energy from the ebb and flood of the water. Wave energy derives from the conversion of energy from the rise and fall of waves. All these options have been produced and are in operation at small scales.

Wind energy is a very old and well known energy source, and is increasingly becoming the first choice alternative. Worldwide, there is over 25,000 MW of installed capacity, mostly in Europe and the USA.

Solar energy could be in the form of photovoltaic cells, which are used to convert light energy into electricity, and solar thermal whereby solar energy is used for heating water. Solar energy could, in theory, provide 10,000 times the energy presently used on earth.

Biomass, biogas and bioliquid energy sources can provide heating, cooling and electricity across all the size ranges, from small stoves to large power stations. Most of these are still at the experimental stage with no firm solutions for sustainable production.

The world needs to use less energy and at the same time produce energy efficiently and in a sustainable manner.

Defence and Security
Weapons of war and mass destruction continue to be manufactured in the world, creating a tense and non-peaceful world. The percentage of the GDP put into the arms and war is so large today that if this was diverted to solving other world problems, significant progress would be made. This investment in defence and security is in all facets of the society, from education to research, from manufacturing to actual wars that lead to destruction of lives and properties.

Role of Engineering and Technology in Providing Strategy Formulation
National Planning in Nigeria has mostly been in the hands of politicians, economists and sociologists, with not enough emphasis on engineering. Most of the issues discussed above are, however, rooted in the development of engineering and technology. Virtually all the considerations of economic production (agriculture, mining,

manufacturing and construction) and physical infrastructure (transportation, water supply, power supply, waste management and ICT), are predominantly driven by engineering. Two other development sectors, Land Use (Ownership & Tenure, Land Use Plan), and Social Infrastructure (Education, Health Care, Housing, Sports & Recreation) have considerable engineering and technology input without which significant progress cannot be achieved. The remaining three sectors, Population (Population Growth, Migration), Human Capital Development (Orientation, Life Time Engagement), and Good Governance, Law and Order, Peace and Security are not primarily engineering driven, but can benefit immensely from engineering and technology.

Too frequently, engineering inputs are considered as operational details to be invited when the policy decisions have been taken, rather than strategic inputs at the formulation of policies and strategies themselves. This is the wrong approach to development planning which has not, and will not lead to meaningful development.

CHAPTER 15

ENGINEERING IS DEVELOPMENT

Images Engineering in Development

Image above: Design Process for Products
Opposite top image Manufacturing Process for Products
Opposite bottom image: International Trade

Images: iStock

Engineering in Our Daily Lives

Indeed, we make bold to state again that engineering development is national development. This is one principle that has not been adequately appreciated by governments in the third world. Governments that have come to this understanding have made the transition from underdeveloped to developed societies in relatively short periods of time. Those which have not remain in poverty and misery.

One only needs to look at a day in the life of any member of the family, and the critical and irreplaceable contribution of engineering is so self-evident. Perhaps it is its being so self-evident that makes it lose its significance.

We all wake up in the morning and use the bathrooms supplied by water provided by engineering. We prepare our food with cookers, fridges, micro-wave ovens, and other appliances manufactured by engineering processes. The electricity that powers these equipments is generated and distributed by engineering. We go to our different destinations by cars, buses, motor-cycles, trains, boats and bicycles, all produced by engineering designs and manufacturing. At our different places of work, we use paper, computers, photocopiers, telephones, air-conditioners, staplers, pens, pencils, biros and several other items, all products of engineering ingenuity and manufacturing processes. We return home the way we came and repeat our domestic chores of the morning. We relax by watching television, listening to music, or simply sleep in beds in our houses, all these being the product of engineering construction and manufacturing processes.

When we go to the theatre to watch films, plays or other entertainment, the engineering infrastructural back-up is again taken for granted. Theatres only work because engineers have provided the air-conditioning and ventilation systems that ensure our comfort; the lighting and acoustic systems that ensure our enjoyment of the experience, the manufacture of the different musical instruments from the piano to the guitar, the drums, the accordion, the cello and indeed the entire orchestra. The construction of the theatre itself, our transportation to and from the theatre and several other support infrastructures are all products of engineering processes, skills and knowledge.

When we go to watch sports, we must remember the stadiums in their complexity, the sports kits from jerseys to shoes, balls of all sorts to bats, rackets and sticks, the media through which millions all over the world enjoy the sports, the different modes of arriving at the sports venue – air, rail, road, and water transports, there is no aspects of sports that is not critically impacted upon by engineering.

We must extend engineering significance to the production of food and water. Agriculture today can only thrive in a fully mechanised process, bringing water from far places for irrigation, tilling the land with tractors, mechanised harvesting, storage, preservation and distribution are all driven by engineering. Water is hardly ever available in the right quality and quantity where it is needed for human use. Engineering purifies water for drinking and transports it to the points of need.

Health care, communication, sanitation; in just about any facets of life as we know it today, engineering is critical. The world talks about world trade. What are traded are, however, mostly products of engineering processes or with significant engineering input. How much trade would there be without engineering?

Defence and security are issues of national pride driven by weapons and equipment that can only be manufactured by engineering processes.

So Why Is There No Strategy for Engineering Development?

If engineering plays such critical and domineering roles in our lives, then why is it so difficult for national governments in third world countries to appreciate the importance of science and engineering and give it the attention it requires? Why is it that the economy of third world nations ignores the basic ingredient of production as the primary source of all income? Why is national development left in the hands of theorists who only understand the theory of production without the art of production itself? Why are ministries of finance, commerce, defence, justice, information and similar others manned with experienced and competent economists, lawyers and journalists, while ministries responsible for infrastructures, manufacturing, agriculture and similar productive endeavours are manned mainly by political considerations rather than by those with professional competence and accomplishments?

Why do we have such poorly articulated national infrastructure programmes without clear visions and strategies for implementation? Why do we talk about 10, 20 or 30 years vision without clear strategies

that are measurable yearly for their achievements? What happened to the 5-year development programmes that were well articulated and provided a coordinated set of actions for national development? Why have development programmes become political tools for the manipulation of the masses?

National Strategy for Engineering Development

Re-Orientation of the Leadership and Society at Large

The starting point in developing a strategy for engineering development is to re-orientate and re-educate the national leadership as to the critical importance of engineering in national development. Leadership of engineering institutions must be based on a thorough understanding of issues. Political parties must have science and engineering research wings that will educate the party leadership on engineering issues and discuss these at policy level. Election debates must centre on how to technically develop the nation, with clear understanding of the technical requirements.

Deriving from such manifestos, competent professionals must be identified and employed to lead critical ministries and committees of the house of assembly with responsibility for development. The program to implement must be clear and rigorously implemented, and the society in general must understand it and feel its impact.

The irony is that Nigeria is very rich in human and material resources for development, both in the country and in the diaspora. There has not been adequate platform for these Nigerians to be heard and to make the significant input necessary for development.

The re-orientation must centre on the development and utilisation of local capacities to their optimum in every aspect of our national development. It must be rooted in the belief that unless this is done, we shall continue to be a dependent nation. With increasing scarcity of resources, we shall continue to get poorer, and the quality of life will continue to diminish.

The re-orientation must emphasise that a nation that depends not only on imported technology, but also on imported finished goods including clothes, food and items of daily consumption is an endangered nation. It must emphasise that our major source of revenue today is oil, and that it is bound to be exhausted very soon. Although it is being replaced by gas, developed nations are already investing in alternative energy, and our revenue from oil might continue to diminish relative to our expenditure.

The leadership and the population must be made to appreciate the investment being made in research and development by other nations, and the continuing increase in the gap between the developed and developing nations. It must communicate and act on the basis that we are already decades behind in the development effort, and that we must start now. Any further delay endangers our development further.

Education: Primary, Secondary, Vocational and Tertiary

The basic input into development is education at all levels. Primary education leads to secondary, and on to tertiary and vocational institutes. These, of course, require rigorous curriculum design, training and proper motivation of teachers, and the recognition of the relationship between theory and practical education. Ultimately, the understanding of the basic forces of nature must be mastered and the application of this knowledge to solving practical problems must be entrenched.

A nation that leaves the education of its youth to poorly motivated, ill-trained and poorly paid teachers endangers the future of these youths, and indeed the country itself, and this is what we are doing in our country today. One only needs to visit our schools, even in urban areas, to see how rundown the physical infrastructures are. The physical rundown no matter how bad, is however minor compared with the deterioration in the quality of staff. Teachers are often absent from class, and where present, are so rundown themselves that they are unable to impact knowledge or motivate young minds. At the same time, the leadership visits these schools with such ostentation and expect the teachers to be grateful for being paid part of their outstanding salaries.

Vocational institutions are grossly inadequate and ill-equipped. Universities continue to expand and admit students without adequate physical infrastructures, equipment, library, teachers or appropriate environment for development. The universities are not guided by any national strategy and policies, and there are thousands of graduates roaming the streets without jobs, and not even sure of their own competences. Our professors drop their titles as soon as they reach foreign lands, in the knowledge that they cannot live up to these titles when compared with their peers abroad.

It is not that Nigeria has not always realised the critical position of education in national development. It is that it has lacked the discipline to develop and enforce a clear strategy. The resulting effect has been decadence.

Research and Development

The objective of education at the highest levels is to empower the educated citizens to address and solve contemporary problems for which there are already standard solutions. Most of the problems confronting Nigeria today are in this category. They include road construction, water supply, electricity supply, housing production, food production and several others. These problems have been solved by several nations all over the world, and can indeed be solved in Nigeria in a relatively short time with appropriate strategy, focus and concentration of efforts.

Research and Development, however, go beyond basic production to address more difficult issues. It anticipates problems and issues, studies them, and pushes the frontiers of knowledge in solving them. Contemporary examples of the output of research and development include the cell phone, internet, computer technology and space travels, among others.

Nigeria has also always realised the critical input of research and development but has also lacked the discipline to develop and enforce a strategy. Through the years, over thirty research and development institutions have been established, excluding universities which are also expected to carry out research.

These research institutes are listed in table 17:

Table 17: Research Institutes in Nigeria

1. The Cocoa Research Institute of Nigeria [CRIN], Ibadan
2. Federal Institute of Industrial Research Oshodi (FIIRO), Lagos
3. The Forestry Research Institute of Nigeria [FRIN], Ibadan
4. Hydraulic Equipment Research Institute (HERI), Kano
5. Institute for Agriculture Research (IAR), Zaria
6. Institute for Agricultural Research and Training IAR&T, Ibadan
7. Lake Chad Research Institute (LCRI), Maiduguri
8. National Agricultural Extension and Research Liaison Service (NAERLS), Zaria
9. National Animal Production Research Institute (NAPRI), Zaria
10. National Agency for Science and Engineering Infrastructure (NASENI), Lagos
11. Nigerian Building and Road Research Institute (NBRRI), Lagos
12. National Cereals Research Institute (NCRI), Badeggi, Niger State
13. National Centre for Genetic Research and Biotechnology (NCGRB)
14. National Institute for Freshwaters Fisheries Research (NIFFR), New Bussa
15. Nigeria Institute for Oil Palm Research (NIFOR), Benin City
16. National Horticulture Research Institute (NIHORT), Ibadan
17. National Institute for Medical Research NIMR), Yaba
18. Nigeria Institute for Oceanography and Marine Research (NIOMR), Lagos
19. National Institute for Pharmaceutical Research and Development (NIPRD), Abuja
20. Nigeria Institute for Trypanosomasis Research (NITR), Kaduna
21. National Root Crops Research Institute (NRCRI), Umudike, Abia state
22. National Research Institute for Chemical Technology (NRICT), Zaria
23. Nigerian Stored Products Research Institute (NSPRI), Yaba
24. National Veterinary Research Institute (NVRI), Vom, Jos
25. Projects Development Institute (PDI), Enugu
26. Rubber Research Institute of Nigeria (RRIN), Benin City

The intensity of Research & Development expenditure (measured as the percentage of GDP spent on R&D) is a good indication of the competitiveness of a country's economy. The OECD country with the highest R&D intensity is Sweden at 3.98% of GDP, followed by Finland at 3.48%. The United States R&D expenditure measured 2.68% and the average for the 25 European Union (expanded) member states was 1.82%. The European Union has set a goal of achieving an average R&D expenditure of 3% of GDP by the year 2010. South Africa is 0.7% and has set a goal of achieving R&D expenditure equivalent to 1% of GDP by the year 2008. India is 1.2% and China 1.4%. Nigeria's national Research and Development intensity under the Ministry of Science and Technology is about 0.06%. Clearly, there must be massive increase in R&D expenditure to yield a national R&D intensity of at least 1.0% within the shortest possible time as other nations are doing.

For instance, the number of technological research workers in Russia increased from 98,300 in 1940 to 1,307,000 in 1978 or a quarter of the total number of scientists in the world, and the expenditure on science and technology rose from 300 million rubbles or =N=247m in 1940 to 19,000m rubbles (=N=15.9 billion in 1978 at the current exchange rate). In 1959, their expenditure on scientific research was of the same

magnitude as their defence budget. The same story can be repeated for Britain and for the U.S.A. whose budgets for technological research are measured in billions of dollars.

This is how the developed nations which we envy encourage technological developments. The researchers of the Western World who are responsible for the inventions that are making their marks on the technological scene today are heavily sponsored by their governments and industries. Vast amount of money is spent without any guarantee of an early breakthrough; or that the money spent on research will yield immediate profitable returns. For example over £300m was spent by the combined team of English and French designers on the design and manufacture of the prototype of the Concord Aircrafts; and from all account the expectations of its sponsors that it would be in great demand by the airlines of the world was not realized. But here in Nigeria, universities have very little if any funds for research, and everybody including the government expects them to produce first class materials for the country's development.

Construction, Manufacturing, Oil & Gas, Agriculture

In addition to education and research and development, practical execution of projects is the manifestation of the successes of these efforts. A tremendous amount of construction needs to be done in the country, from transportation to water supply, power supply, housing and environmental protection. It is amazing that Nigeria has no capacity to execute any but the most basic of these infrastructures. For over 90% of our infrastructural requirements, we are dependent on foreign technical and managerial support for which we pay very dearly.

A very strong construction industry is critical for development. Firstly, it provides the infrastructures required at the relatively lowest price so that the whole of the construction expenditure is retained in the country. Secondly, it provides employment to very many people, for the construction industry is a large employer of labour with very long chains of support services. Thirdly, it builds capacity and allows exportation of national expertise. Fourthly, being local, it remains on hand to provide experience for the further development of the industry. Finally, it provides opportunities for graduates of universities, a receptor for the outcome of research and development, and further funding of such research and development.

Ignoring the construction industry or leaving it as a poorly developed local industry is a recipe for disaster. It is like leaving the banking sector or the security of the nation to the private sector without a national policy or guidance.

Manufacturing developed in Europe from the industrial revolution of the seventeenth century, and the mass production of goods for local consumption significantly improved the quality of life. Mastering production skills has become the basis for national development. From China to India, Taiwan to Brazil, manufactured goods are produced efficiently and exported to consumer nations. Like construction, but with much less capital expenditures, the manufacturing sector provides employment, retains capital, improves trade balance and serves as a receptor for research and development.

Agriculture is the third major area for the provision of employment, retention of capital, receptor for research and development, and improvement in trade balance. Ensuring adequate food supply is also a matter of not only national pride but national security. The engineering complement of this sector is often under-appreciated. The provision of irrigation infrastructures, farm implements, manufacture of fertilisers, storage and preservation facilities are critical engineering inputs that must be addressed.

Linkages between Education, Industry, R&D and National Priorities

We do not need elaborate visioning processes to determine our national priorities. They are pretty obvious: we need to get every citizen engaged in meaningful productivity in creating wealth and providing water, power, roads, schools, health care and all the other infrastructures required for good quality living in a sustainable manner. The chain of event is re-orientation – education – productivity – research and development – improved productivity. The linkage between education, industry, research and development and national priorities must be strongly established. Young people should see this connectivity right from the secondary schools if not primary schools, and government should facilitate the establishment and sustenance of the linkages.

Engineering as the Central Focus of Our National Development

For the next couple of decades, engineering and technology must be the central focus of our national development if we are to be on the path to sustainable development. We are naïve in thinking that our national

development has been driven to date by any other sector of the society but engineering, for it is the production of oil and gas that has been our mainstay. Unfortunately, this has neither been a strategic decision, nor has it been nationally driven. Production and marketing of our oil and gas has been in foreign hands, and will remain so until we acquire competence in engineering and technology.

Global surveys show very strong correlation between the number of engineers in a country and its level of development as shown in Table 18

Table 18

Country	Population/Engineer (approx)
China	130
India	157
Canada	179
Brazil	227
Japan	303
UK	311
USA	389
Malaysia	543
Singapore	1341
Ghana/Nigeria	12000 – 13000

As already stated, we must build capacity in agriculture, mining, manufacturing and construction. Starting with the simplest and most commonly used items, we must develop competence and capacity to produce what we need and to be self-sufficient in them. We can then graduate to more complex items until we can produce most of our requirements.

Call for Reform in the Construction Industry

This call for action is an excerpt from the inaugural address of the 12th President of the Association of Consulting Engineers Nigeria, Engr. Bayo Adeola delivered on the 12th of March 2008.

Nigeria faces enormous challenges on many fronts. Peace and security of lives and properties continue to challenge us. Good governance and economic prosperity continue to elude us. Basic infrastructures remain grossly inadequate. Yet our country is blessed with human and material resources, enough to provide a secure future for our children. The challenge of the Nigerian nation is our inability to mobilise our people and resources for the development of our nation. The plight of Nigerian engineers typifies the frustration of highly trained professionals in our country.

The Nigerian engineer faces enormous challenges today, whether in the academic, manufacturing, civil service, construction or consulting practice. After a rigorous and difficult training in the university, he graduates into a society where there are hardly any opportunities for him to practice his profession. And when he does find employment where he can practice, he is often paid subsistent wages, and his future as a professional engineer remains uncertain. At the same time, he watches his colleagues enjoy a decent income in other sectors of the economy. The engineer therefore, against his wishes, abandons the profession and seeks a better quality of life in banks, management consulting and other sectors of the economy. Those with enough resources and ability, or from frustration and despondency, leave the country and thrive or waste away abroad as the case may be.

Tens of thousands of highly trained Nigerian engineers and other professionals in the diaspora are contributing to the economies of other nations. Nigerian parents and governments spent billions of Naira to train these fellows, only to lose them to other countries. The same challenges face consulting engineering firms, most of which remain small subsistence practices.

Perhaps the society does not realise that it is the responsibility of the engineer to provide all the infrastructures required for decent living that are so glaringly lacking in Nigeria today. Power generation, transmission and distribution; road, rail, water and air transport; water supply, irrigation and drainage; solid, liquid and gaseous waste management; telecommunications; oil exploration, refining and distribution; mining and manufacturing; all these sectors have engineering as their core disciplines. Perhaps the society does not realise that unless and until a critical mass of highly competent professionals in these disciplines has been developed locally, these infrastructures will continue to elude us. Perhaps the society does not understand that no amount of reliance on foreign expertise can deliver us to the promised land of quality infrastructures.

The challenge is to provide an enabling environment for engineering, and indeed professionals in all sectors to develop. In not providing such enabling environment, our society not only suffers in the present, but is positioning itself for even greater suffering in the future. In preferring to buy fish rather than learning to fish, we mortgage the future for the present. In using foreign experts for the provision of infrastructures, we condemn our future potential as a technologically developed nation for the short-term benefit of projects to attribute to our names. Of course we need foreign expertise. But we need them only to partner with us in the development of our country.

One of our challenges at ACEN is therefore to seek to engage governments and politicians for the creation of an enabling environment for engineering practice. Much engineering work is going on in the country, but local capacity is not being built. The only way to build capacity is to train people and give them opportunities to practice. Continuous practice leads to continuous improvement and ultimately to expertise. Opportunity to practice comes from patronage. The Obasanjo administration, in realisation of this situation, introduced the local content policy in the oil and gas industry, and many Nigerians are the better off for it today. ACEN would want the local content policy to be extended to all projects being carried out by all governments in Nigeria, be it at federal, state or local government level. ACEN would seek to explain the critical input of the consulting engineer in national development to those who have the responsibility and authority to carry out these functions.

Changes in Consulting Engineering Practice

The primary role of the consulting engineer is to conceptualise, design and supervise the provision of infrastructures. For a long time, the provision of such infrastructures was the responsibility

of governments only, and consulting engineers primarily provided their services to governments as independent private sector experts. Their independence and expertise make them more objective in their evaluations and recommendations to government. Their counterparts in government are not considered to be independent as they work under the civil service system with its code of conduct.

In more recent times, however, the method of providing infrastructures has changed significantly, especially in the third world. It has been established that the government alone is not able to provide all the infrastructures needed in the country, and the private sector needs to be mobilised for this. New methods of procurement of engineering infrastructures have therefore emerged, mostly involving the private sector in what is referred to as Public Private Partnership, PPP. Methods now adopted vary from direct concession of the infrastructure to the private sector, to financing the project for government, and partnering with government for the provision of such infrastructures. The recently completed domestic terminal of Muritala Muhammed Airport and the on-going upgrading of the Victoria Island-Epe Road, both in Lagos, are examples of such projects.

The consequence of this development is that the provision of infrastructures has moved from an exclusive relationship between governments and the consulting engineers, and new strong stakeholders are taking an active part in this business. The prime movers in the two examples above are not engineering firms but entrepreneurs. The requirements and methods of operation of these private sector businesses are essentially different from those of government.

Even for the dominantly private sector projects, such as housing, offices and factory development, clients are seeking more efficient ways of delivering projects, and 'design and build' method of procurement is becoming increasingly popular. By the use of this method, the responsibility for concept development, design and construction supervision passes to the contractor, who usually leads the 'design and build' team.

These developments require that the consulting engineer redefines his business to be relevant in today's business environment and be more responsive to the needs of the client. Rather than providing only independent consulting services to government, consulting engineers now have to partner with contractors and financiers to deliver projects. Indeed, there is no reason why they cannot lead such consortia. They would, therefore, need to acquire a broader skill set than those provided in engineering schools today and be more knowledgeable in the business practice. Firms need to be larger and multi-disciplinary.

The transformation of our practices from technical solution providers to partners in project delivery is a major challenge of our members today and ACEN is committed to assisting this transformation through education and support services.

Reform in the Construction Industry

Finally, perhaps the time has arrived for a major reform in the construction industry. It took major reforms to reposition our banking industry. Strategic planning and implementation ensured the successful implementation of the current telecommunication program. The public service, insurance and other sectors of the economy are undergoing reforms to ensure improved and sustainable performance.

The construction industry definitely needs to be reformed today. In such a reform, demands will be made of the industry practitioners in the form of technical competence, organisation and capitalisation. In return, the government will undertake to provide work opportunities on a continuous basis and meet its obligations to the industry. A regulating agency to monitor performance by all stakeholders would be required to ensure the positive development of the industry.

Perhaps it is time for the major professional bodies in the industry to consider this proposition and jointly make a strong case to government. Not only COREN, NSE and ACEN on the engineers' side, but all stakeholders in the built and natural environment in Nigeria including architects, quantity surveyors, contractors, manufacturers and all. Perhaps a bill to this effect could be sent to the National Assembly for consideration.

The construction industry is too vital to the development of the nation to be totally left to the vagaries of the private sector without clear policies and regulations.

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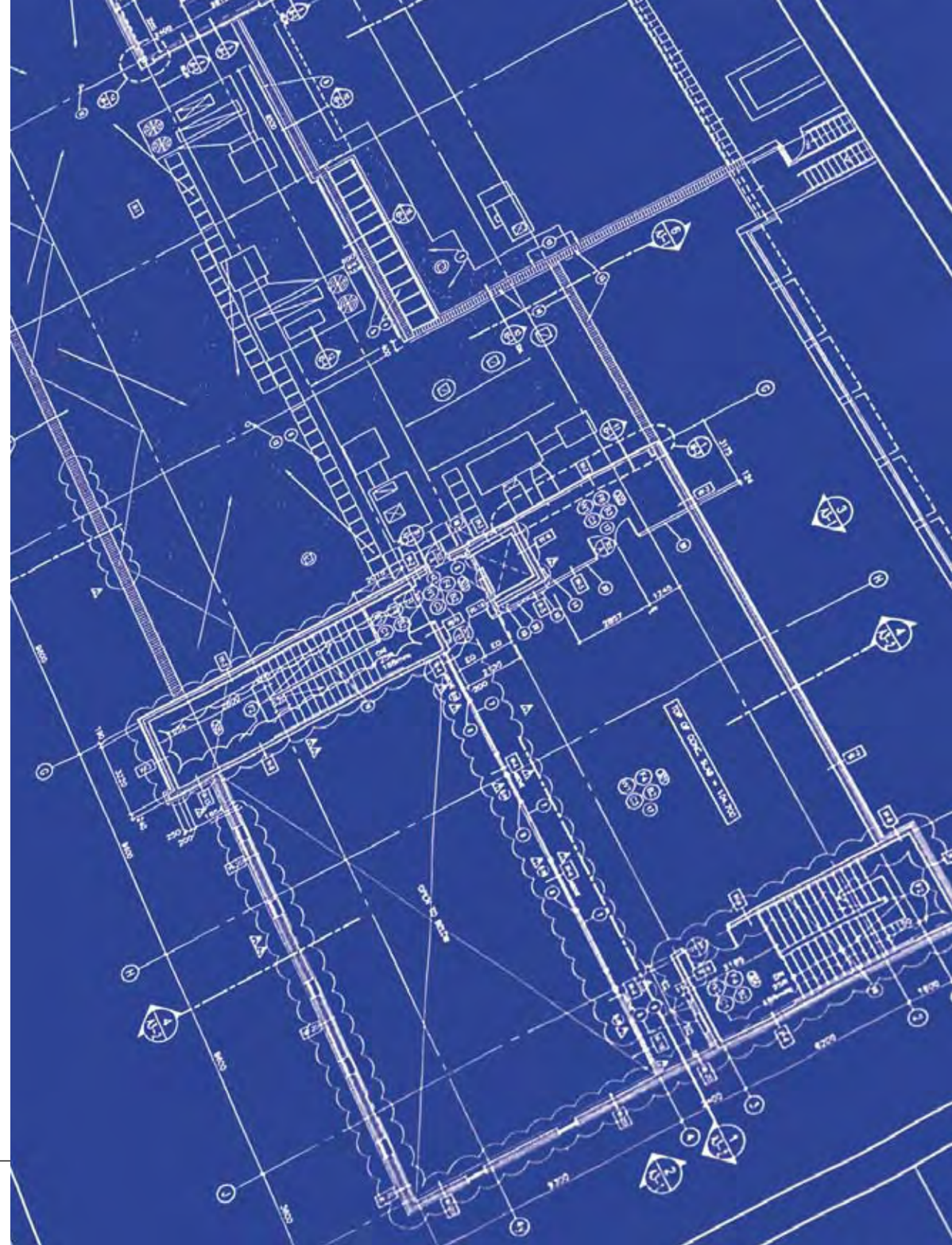

Bayo Adeola is the current president of ACEN. He is the Managing Director of Comprehensive Project Management Services (CPMS) Limited, a Lagos based project management consulting firm. Through his practice at CPMS, he has been instrumental in charting development planning, engineering and the use of project management as high value organisational resources.

There are few opportunities for the broad spectrum of professionals, policy makers and the business community in Nigeria to share historic insights that address the question of how much impact engineering has made on our development in the face of a developmentally challenged history. What is the value of Nigerian engineers to national competitiveness? When have Nigerian construction and manufacturing companies had opportunities to apply attributes of engineering and technology to their processes? How do we evolve professional mindsets informed by a history of political vulnerability and economic instability? What determined the political and economic circumstances that enabled telecoms and banking sectors to succeed despite infrastructure shortfalls? What types of approaches should the Federal Government in concert with state governments take to devise policies that help to create comparative advantage for Nigeria?

The writing of this book became an open forum for a historical assessment of engineering as an engine for economic growth. By default it is a product of research, interviews, colleague-to-colleague dialog, feedback and enquiry. For readers: although you have not been part of the regular set of critical contributors please think of this as 'work in progress', an opportunity to be involved.

Engineering is Development provides a frank view of history in context and an insider's understanding of engineering as a developmental vehicle. The content reflects on the on-going learning occurring from our developmental mistakes as well as successes. It makes explicit the socio-political environment in which Nigeria's engineers have had to function, the absence of a clear strategy for engineering development at the policy and implementation levels. It challenges us, national planners and engineering professionals, to envision possibilities, and knowing what we know now, act in concert to achieve our aspiration for development.

The book highlights the critical interplay between common themes across each chapter and new approaches to linking technology policy, education, industry, r & d, innovation and national priorities. It underscores the need for each of us, decision-makers, stakeholders, professionals within and outside of the engineering community to bring state of the art thinking to the process by which we achieve greater synergies between the basic needs of an average Nigerian, developmental requirements of a physical infrastructure, knowledge intensive capacities and manufacturing efficiency.

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