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Interview with Prof. Ing. Enzo Siviero, on Bridges

***Prof. Ing. Enzo Siviero**, is a Professor of Structural Mechanics at the University of Venice (IUAV), a Consultant Professor at the College of Civil Engineering, Tongji University, Shanghai-China and Vice-Head of National University Council at the Ministry of Education in Rome, Italy.*

Prof. Enzo Siviero

E-Newsletter: *Sir, what are bridges?*

Prof. Enzo: Bridges are not only the physical connections between one side to the another. They are much more. It connects people, nations, generations, cultures and religion. It also has social meaning which is very important related mainly to the beauty of bridges.

E-Newsletter: *What are bridges used for?*

Prof. Enzo: Bridges are used to connect one side to another. They are also used to solve traffic problems. If a bridge is attractive and nice, people will consider it to be a place for sightseeing.

E-Newsletter: *Do we have different types of bridges?*

Prof. Enzo: Yes we have different types of bridges. The normal one is the cross over bridge which is simple and supported with beams and normally used for highways or railways. In case of valleys, we can have suspension bridges, depending if the span is more than 300 or 400 meters. It can be both in steel and concrete.

E-Newsletter: *Is it possible to build a bridge across the Mediterranean sea?*

Prof. Enzo: It is possible and it is a dream of mine to construct a bridge that will cross the Mediterranean. Crossing the Mediterranean can be done between Tunisia and Sicily which is 140km with four artificial islands. There will be connections between 30 to 35 km. The challenge is that we have to go underneath the sea which is a problem but it can be solved. This bridge could solve problems ranging from socio-economic and geopolitical because it will connect Europe through Italy to Africa. The future to me is to connect with Africa.

E-Newsletter: *What kind of engineering speciality would be required to construct a bridge across the Mediterranean sea?*

Prof. Enzo: There are lots of specialties that will be used. In this regard, I asked some professors from twelve different universities in Italy, to help me identify the problems that may be associated with constructing the bridge across the Mediterranean sea and proffer solutions to the problems. We have geotechnical, maritime and energy problems because we can profit from the waves, wind and solar energy. There will be four artificial islands, I am thinking there will be harbours and resorts. I mean something that can be attractive. The real problem we have is the depth of the sea which is around 250 meters. In this case we can use either offshore technology or floating pilings. This is another very interesting option. I am thinking of using materials such as fibre enforcing polymers, carbon fibre; I mean very light tractor because of the span which is not so economical. In that case, it can even enlarge the span of the bridges between 2000 meters to 3000 meters.

E-Newsletter: *Thank you sir.*

L-R: Engr. K. A. Ali FNSE (President of the Council for the Regulation of Engineering in Nigeria), Engr. O. O. Masoji (rep of Lagos State Commissioner for Works & Infrastructure), Engr. Taofiq Ajibade Tijani (Lagos State Commissioner for Energy & Mineral Resource), Engr. Dr. Temilola Kehinde FNSE (ACEN President) & Engr. Mrs. Margaret Oguntala FNSE (representing the President of the Nigerian Society of Engineers) during the Association for Consulting Engineering in Nigeria (ACEN) 36th Annual Conference held on Tuesday 18th November 2014, at Sheraton Hotel & Towers, Ikeja, Lagos.

COMMUNIQUÉ OF THE WORLD ENGINEERING CONFERENCE ON SUSTAINABLE INFRASTRUCTURE (WECSI), EXHIBITION AND ANNUAL GENERAL MEETING OF THE NIGERIAN SOCIETY OF ENGINEERS (NSE) IN COLLABORATION WITH WORLD FEDERATION OF ENGINEERING ORGANIZATION (WFEO) HELD AT THE INTERNATIONAL CONFERENCE CENTRE, ABUJA, 2ND -7TH NOVEMMBER, 2014

1) PREAMBLE:

The Nigerian Society of Engineers and the World Federation of Engineering Organisations (WFEO) held the World Engineering Conference on Sustainable Infrastructure, 47th International Engineering Conference, Exhibition and Annual General Meeting at the International Conference Centre, Abuja, Nigeria from 2nd - 7th November, 2014; with the theme "Development of Sustainable Infrastructure in Africa".

A total number of 21 panelists, 15 lead and 35 technical papers and posters on the following sub-themes were presented and deliberated: Energy and Power; Information & Communication Technology; Construction Technology, Manufacturing & Green Infrastructure; Engineering Education and Sustainable Infrastructure Development; MDGs and Post 2015 Challenges; Financing, PPP & Infrastructure Concessioning; Transport Infrastructure, Housing and Urbanization; Water & Natural Disasters.

The opening ceremony was chaired by the President of the Nigerian Society of Engineers, Engr. Ademola Isaac Olorunfemi, FNSE and the President of World Federation of Engineering Organisations (WFEO), Engr. Marwan Abdel Hamid. The President and Commander-in-Chief of the Armed Forces of the Federal Republic of Nigeria, Dr. Goodluck Ebele Jonathan GCFR, was represented by the Honourable Minister for Works, Architect Mike Oziegbe Onolememen, FNIA (FNSE) CON. The Chairperson, African Union commission, Dr. Nkosazana Dlamini-Zuma and Honourable Minister for Power, Professor Chinedu Nebo, FNSE, were Special Guests of Honour. The keynote address was delivered by the Managing Director, Infrastructure Bank Plc, Mr. Adekunle Rasak Oyinloye. Goodwill messages were delivered through video link by Dr. Nkosazana Dlamini-Zuma, Dr. Vint Cerf, Vice President of Google and Father of the Internet and Ing. Nicola Monda of the Italian Federation of Engineers. There were also goodwill messages by the President of the Council for the Regulation of Engineering in Nigeria (COREN), Engr. Kashim Abdul Ali, FNSE; Ambassador of Nigeria to Singapore, H.E Nonye Rajis-Okpara; Country CEO Lafarge, Mr. Guillaume Roux; Managing Director, Reynolds Construction Company (RCC) and Managing Director, Bolton Consulting Group (BCG), San Francisco, Mr. Jaime Ruiz-Cabrero.

Other dignitaries were the President of the Federation of African Engineering Organisations (FAEO), Engr. (Dr.) Martins van Veelen, representative of the Honourable Minister for Federal Capital Territory, Bala Mohammed, foreign delegates from USA, Italy, United Kingdom, Ghana, Kenya, South Africa, Rwanda and Cameroun participated fully in the Conference. Young engineers and youths also had a full complement of programmes, including innovation project presentation, at the Conference. The Pre-conference Workshop on Business Intelligence (BI) as a powerful tool for sustainable infrastructure development delivered, by Dr. Amos Baranes of the University of Haifa, Israel, was well attended.

2) OBSERVATIONS:

The following observations were made at the end of the Conference, Exhibition and Annual General Meeting:

i. There are 54 countries in Africa with less than 12 joining the 96-member World Federation of Engineering Organizations (WFEO).

ii. It has been established that foreign aid is not sufficient to guarantee economic sustainability in less developed countries.

iii. Nigeria has no National infrastructure report/score cards, whereas evidence shows such as veritable tools for progressive comparative assessment of the performance of nations, regions and states in infrastructure delivery. NSE has convoked a Presidential Expert Group on the development of the maiden Report Card for the country, with a timeline of 12 months for its delivery.

iv. Sustainable iron and steel production is one of the techno-economic backbones for the realization of the MDGs.

v. To realize the MDGs in the agricultural sector, there is need for Government to provide engineering infrastructure to support agricultural practices.

vi. The Pre-conference Workshop demonstrated the potency of Business Intelligence (BI) tool and its applications to all aspects of human endeavour, especially for professionals who often are the champions of enterprises and the private sector.

vii. Africa is reasonably well endowed with conventional and non-conventional energy resources albeit unevenly distributed.

viii. It is not our wealth that creates infrastructure, but it's our infrastructure that creates wealth. Hence higher education has the potential for growth; promotes fast technological development and helps to maximize economic output.

ix. Current policies on building materials require a new approach that would enable the development of novel ideas and reduce the overall cost of construction.

x. Environmental regulations require that we must be more sensitive on energy utilization and waste management.

xi. Africa's abundant water resources are grossly underutilized due to infrastructural deficit. This encourages conducive environment for climate change to thrive across the continent promoting high incidence of flooding and other natural disasters.

xii. Flooding is a multidimensional and integrative phenomenon across Africa that is very difficult to prevent but can be managed to reduce the risk and associated vulnerability.

xiii. There are available, hydrologic and GIS-based models developed and applied to study, assess and forecast flooding and natural disaster incidences in developed economies, for possible adaptation and necessary capacity building for African nations.

xiv. Design and construction of physical infrastructure delivery in developing countries do not often take adequate consideration of environmental conditions and maintenance demands, resulting in frequent damages, failures, wastages and low performance.

xv. Collaboration among intra- and inter-agencies in physical infrastructure in developing countries is very poor. This is why the current effort to develop a long-term **integrated** infrastructure master plan by Nigeria is to be applauded.

xvi. Similarly, partnership and synergy between professional organizations and Governments in the entire circle of providing physical infrastructure is very weak and this affects national capacity for delivery in most developing countries.

xvii. The promotion of green infrastructure in developing countries is noble in our quest to ensure sustainability, as green infrastructure seeks to intertwine human efforts in providing solutions through the building of infrastructure with the other provisions of nature.

xviii. Economic growth of nations is measured by the rate of, and the effectiveness of the deployment of e-governance, e-technology to support infrastructural development drive.

xix. The role of the Infrastructure Concessioning & Regulatory Commission (ICRC) in promoting PPP to enhance infrastructural development in Nigeria and its ability to share such experience with the state and other Africa countries would go a long way in ensuring sustainable and quality infrastructure in Africa.

xx. Many developing African countries should be in a position to finance infrastructural development wholly in spite of competing needs and financial constraints, if available public funds are judiciously, frugally and patriotically utilized, and private capital mobilized.

xxi. In this regard, financial tools that developed and most developing nations apply for developing and maintaining their infrastructure and industry ought to be applied by African countries without further delay. Such tools include:

- Policy-based finance created and controlled by the National Governments, made available on a revolving commercial basis to prioritized projects through Development Banks. It was noted that Japan set aside about 50% of their general account (about 8% of GDP) in this regard to spur development.
- Policy-based credit provided from funds generated from Central Bank's skillful use of her discount rates; deposit money banks, funds mobilized from external borrowing, excess crude oil and other minerals earnings.
- Strategic use of pension funds.

xxii. In respect of Green Infrastructure Development and PPP, serious challenges still exist in the areas of Institutional, Legal, Regulatory and Financial Frameworks. These challenges often lead to delays in project execution/delivery.

xxiii. Realistic assessment does appear to suggest paucity of technical capability and technological capacity in developing countries to drive the infrastructural development initiatives including the PPP approach.

xxiv. Women apparently bear the brunt of the existing significant deficit in sustainable infrastructure in sub-Saharan Africa.

xxv. Women engineers constitute an insignificant percentage of engineers worldwide, but particularly in Africa, whereas women are instinctive creators and inventors of engineering solutions even in rural areas.

3) RECOMMENDATIONS:

The following recommendations to the above observations were proffered:

i. There is need for WFEO to renew strategies that bring together all engineers in the 182 countries worldwide with special emphasis on the Abuja Declaration, which was launched at the conference.

ii. African countries must improve the competitiveness of the continent by taking practical steps towards increasing trade infrastructure at lower costs of transactions and increased efficiency that spur private sector growth through appropriate Public-Private Partnership models which drive investments in critical sectors of the economy.

iii. While commending the NSE for promptly and proactively instituting an Expert Panel to develop the maiden Nigeria Infrastructure Report, the timeline established should be made sacrosanct, while the cognate experience of our comparator countries should be leveraged.

iv. It is recommended that the Nigerian Government should demonstrate the political will and commitment to reactivate the steel industry to provide the necessary vehicle for industrial transformation and growth. Other African countries should also pay proper attention to the development of their iron and steel industry.

v. Infrastructure to support agricultural production should include rural electrification, ICT facilities, rural housing, animal and plant housing, rural water supply, agricultural waste management, machinery for processing agricultural and food materials, facilities for the storage of agricultural and food items, irrigation schemes, erosion control and drainage systems and rural roads. These should be critical components of any integrated infrastructure master plan.

vi. For Engineers and other professionals to remain relevant and competitive in exploiting available opportunities, they must increase their degree of 'business intelligence' by investing in information technology and developing their capacity to migrate from operational to strategic approaches.

vii. African Professional Engineering Organisations should domesticate and effectively disseminate the BI approach widely in order to motivate professional engineers to become more analytical and be more able to forecast the future precisely and optimize resources.

viii. Such training should also emphasis the need for adequate planning, design and construction practices and adequate maintenance of sustainable infrastructure in order to reduce damages, failures, wastage and low performance.

ix. Mechanism should be put in place to encourage more intra and inter agency collaborations to ensure optimal infrastructural utilization and sustainability.

x. Professional Engineering Organizations should partner with Governments at all level to develop appropriate laws, regulation, and guidelines to ensure compliance of technical, legal and financial standards using world best practices in the establishment of physical infrastructure in developing appropriate road design models (including rigid and reinforced roads).

xi. Proven hydrological models in the area of flooding and natural disaster mitigation should be properly adapted to the African context to guide policy formulation, development of strategies and implementation at Catchment River Basins and National levels.

xii. In the same vein, Professional Engineering Organization should initiate inter – ministerial synergy between relevant Ministries, Agencies & Departments (MDAs) in the adaptation of the world best practices in preventive and remedial measures against flood related incidences and natural disaster.

xiii. Regulatory authorities should provide environmental guidelines that will ensure that operators and developers maintain harmony with nature at every stage of any infrastructural project to ensure green environment. Strict compliance and penalty frameworks should be part of the guidelines.

xiv. African Professional Engineering Organizations must partner with tertiary institutions and the relevant regulatory bodies to review the standards of admission to tertiary curricula and post-graduation internship programme in order to produce effective and promising skills-oriented graduates.

xv. Since engineering education is key to competitiveness, engineering faculties should be in the forefront of infrastructural development through the fabrication of necessary equipment, developing skills required for industries, and align engineering skills towards the defined societal needs.

xvi. In view of the slow pace of technological emancipation of developing countries, there is an imperative need to strengthen higher education in the areas of science and technology to reinforce and sustain the infrastructural development drive.

xvii. There is also the overarching need for Capacity development and promotion of excellence to develop expertise and skills in strategic areas such that the Engineering profession can support critical areas like medical care delivery, agriculture, water and sanitation, sport etc .

xviii. ICRC should lead in the development of generic templates for the structure and procedures of PPP units or departments according to world best practices in order to promote PPP at all levels of the national economies.

xix. African Engineering Professional organizations are to establish coalition with other key stake holders like the Lawyers for sustainable promotion of PPP through capacity building, advocacy and due diligence. For Nigeria it is also imperative to support and strengthen the existing synergy between ICRC and the Bureau for Public Procurement (BPP) in the promotion of PPP beyond our borders.

xx. There is need for sustained advocacy and engagement by professionals to push the speedy completion and passage of the reform bills that would facilitate PPP in the country. This would create the enabling environment to ensure the emergence of credible regulations to allow and empower regulators, operators etc discharge their functions professionally and diligently.

xxi. Africa Countries should skillfully adapt and domesticate best practices with respect to relevant frameworks for Green Infrastructure Development and PPP.

xxii. Nigeria should without further delay lead other African countries in creating policy-based finance for infrastructure and industrial development projects through setting aside at least 30% of the Federation Account. In the same vein, the proceeds of the Central Bank's discount rates, excess crude earnings should be harnessed into a policy-based fiscal investment programme. Pension funds should also be applied into bankable productive infrastructure and industrial projects, rather than allowing such funds to lie fallow.

xxiii. Governments and private institutions should support and invest in renewable energy solutions for rural dwellers (most of whom are women) so that they can improve their standards of living and thereby derive the full benefits of available ICT tools/systems such as mobile phones, internet resources, etc. This will also positively impact the health and education of youth by providing affordable and reliable electricity supply for homes, schools and hospitals.

xxiv. In this regard there is need for sustained advocacy for women, in particular, to be educated on the negative environmental impacts of some traditional activities like bush burning, use of firewood and be encouraged to use cleaner and more environmentally friendly alternatives.

xxv. Females should be encouraged to pursue formal education, take up sciences at secondary school level, and study engineering at tertiary institutions to increase the unacceptable low percentage of female engineers globally.

Arising from the depth of expertise demonstrated in the entire technical discussions and the value of the recommendations thereof, there is need for a regular infrastructure summit of this type to feed into our National policy on infrastructure for sustainable development of Nigeria and Africa.

2015 EXECUTIVE OFFICERS:

With the collaboration of NSE and the NigComSat Ltd, the Society successfully deployed E-voting, wholly developed by Nigerian Engineers, for the election of the following officers (iii-xi) to run its affairs with the President and Deputy President in 2015:

Engr. Ademola I. Olorunfemi, FNSE	- President
Engr. Otis Anyaeji, FNSE	- Deputy President
Engr. Giandomenico Massari, FNSE	- Vice President
Engr. Mrs. Margaret A. Oguntala, FNSE	- Vice President
Engr. Mohammed Babagana, FNSE	- Vice President
Engr. Mrs. Aishatu A Umar, FNSE	- ECXO Member
Engr. Joseph O. Akinteye, FNSE	- ECXO Member
Engr. Dr. Mrs Edith Y. Ishidi, FNSE	- ECXO Member
Engr. Mrs. Nkemnasom E Eziokwu, MNSE	- ECXO Member
Engr. Dennis Dania, FNSE	- ECXO Member
Engr. Muhammad I. Abbas, MNSE	- ECXO Member
Engr. Mustafa B. Shehu, FNSE	- Immediate Past President

Engr. Ahmed K Amshi, FNSE
Executive Secretary

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NOTICE! NOTICE!! NOTICE!!!

All members of **NSE Port Harcourt Branch** should pay their **Annual Branch Dues** of **N5000** for **Corporate Members** and **N7,500** for **Fellows** to **UBA Account No. 1000183629 (Port Harcourt Main Branch).** Also pay **National Annual Subscription** of **N9,000.00** for **Corporate Members** & **N11,500** for **Fellows** directly to **First Bank Account No. 2020502052** & forward all tellers to the secretariat for reconciliation. All payments should be made into the bank accounts.