

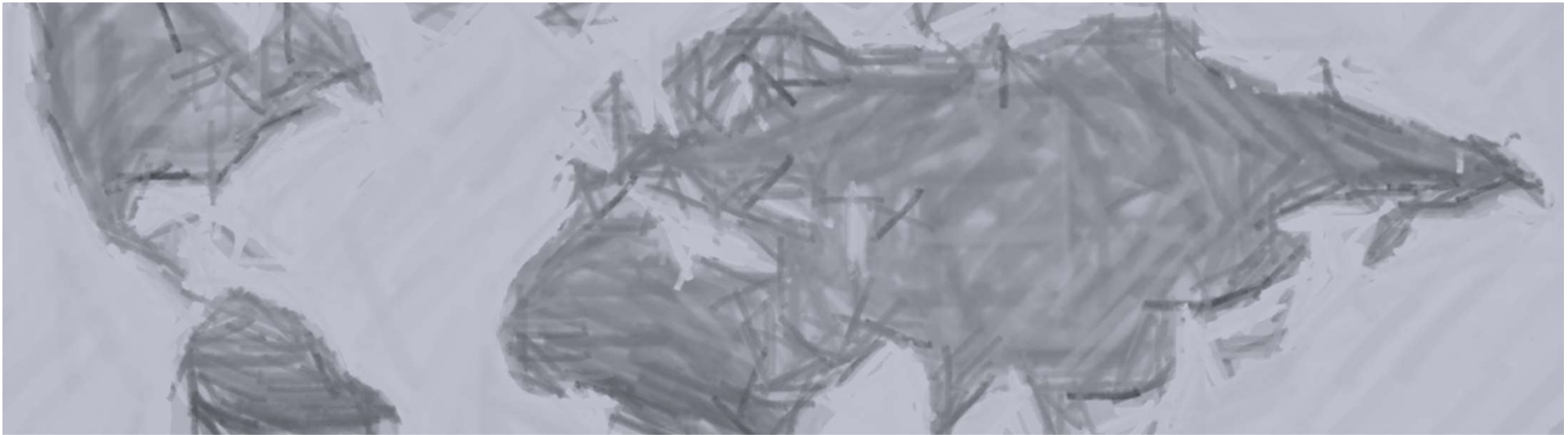
Africa Working Group on Natural Sciences

**Capacity Building and Engineering Activities in Africa
31st January 2019**

**Speaker Name:
Dr. Marlene Kanga AM
President WFEO**

Engineering for Sustainable Development

www.wfeo.org



- **The international organization for the engineering profession**
- **Founded in 1968**
- **Under the auspices of UNESCO**
- **90+ national engineering institutions**
- **Representing 30+ million engineers**



Engineering for Sustainable Development



Algeria
Argentina
Australia
Bahrain
Bangladesh
Belize
Bolivia
Brazil
Bulgaria
Cameroon
Canada
Chile
China
Chinese Taipei
Colombia
Costa Rica
Croatia
Cuba
Cyprus
Czech Republic

Ecuador
Egypt
Ethiopia
Fiji
France
Germany
Ghana
Greece
Honduras
Hong Kong, China
Hungary
India
Iraq
Italy
Ivory Coast
Japan
Jordan
Kenya
Korea
Kuwait

Lebanon
Libya
Macedonia (FYROM)
Madagascar
Malawi
Malaysia
Malta
Mauritius
Mexico
Moldavia
Mongolia
Montenegro
Morocco
Nepal
New Zealand
Nigeria
Pakistan
Palestine
Peru
Poland

Portugal
Puerto Rico
Qatar
Romania
Russia
Rwanda
Saudi Arabia
Senegal
Serbia
Sierra Leone
Singapore
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Sudan
Switzerland
Syria
Tanzania

The Philippines
Tunisia
Turkey
Uganda
Ukraine
United Arab Emirates
United Kingdom
United States
Uruguay
Yemen
Zambia
Zimbabwe





Only International Engineering Organisation representing all disciplines that is recognised at the UN

Co-Chair Major Science and Technology Group at UN

10 x Standing Technical Committees

Executive Council

Executive Board

Supported by a small secretariat based in Paris

Engineering for Sustainable Development



WFEO Committees and Working Groups

- **Engineering and the Environment (Hosted by UK)**
- **Energy (Hosted by USA)**
- **Engineering Education (Hosted by Lebanon)**
- **Information and Communication (Hosted by India)**
- **Engineering and Innovative Technologies (Hosted by China)**
- **Engineering Capacity Building (Hosted by South Africa)**
- **Disaster Risk Management (Hosted by Peru)**
- **Anti-Corruption (Hosted by Zimbabwe)**
- **Women in Engineering (Hosted by Nigeria)**
- **Young Engineers/Future Leaders (Hosted by Kuwait)**
- **UN Relations Committee (Hosted by USA)**
- **Working Group on Water (Hosted by Spain)**
- **Working Group on Global Infrastructure Report Card (Hosted by Federation of African Engineering Organisations)**



Partnering with our international peers

- UN SDG 17 : Partnerships
- Together we can progress joint objectives in education, training and sustainable development
- Partnerships with:
 - International Engineering Alliance (IEA)
 - International Federation of Engineering Education Societies (IFEES)
 - Federation of International Consulting Engineers (FIDIC)
 - International Network for Women Engineers and Scientists (INWES)
 - International Centre for Engineering Education (ICEE, UNESCO Centre)
 - International Science Technology and Innovation Centre for South-South Cooperation (ISTIC, Malaysia, UNESCO Centre)
 - International Science Council (ISC)



Influencing...

a respected source of advice & guidance on engineering and technology

Supporting...

UN sustainable development goals

Partnering...

with our international peers in engineering and science

Growing...

engineering capacity and mobility

Improving...

the ethical engineering practice and a diverse and inclusive profession

Convening...

world engineers' events

Recognising...

excellence in engineering



Working with international organisations

- **UN Economic and Social Council, (ECOSOC),**
- **UN Department of Economic and Social Affairs (UNDESA),**
- **UN Development Program (UNDP),**
- **UN Educational, Scientific and Cultural Organisation (UNESCO),**
- **UN Industrial Development Organisation (UNIDO)**
- **UN Environmental Program (UNEP)**
- **UN Framework on Climate Change (UNFCCC)**
- **UN Office for Disaster Risk Reduction (UNISDR),**
- **The International Atomic Energy Agency (IAEA)**
- **The World Meteorological Organisation (WMO)**

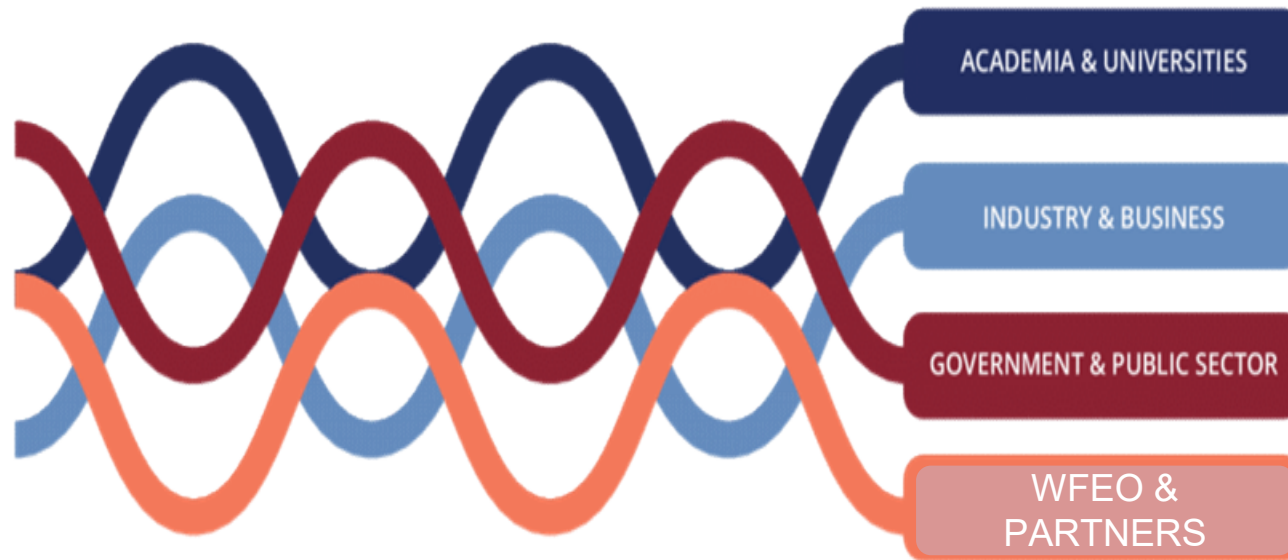


WFEO Engineering 2030 Plan

- **WFEO Engineering 2030** - A Plan to develop engineering capacity for a sustainable world through partnerships with educators, government, industry and professional engineering institutions
- a strategic initiative to address the gap in engineering capacity and the quality of engineering professionals
- recognises that engineers are essential for sustainable development good engineering is essential achieving the UN Sustainable Development Goals Consistent with the mission and objectives of WFEO
- WFEO will be leading and co-ordinating the Plan with its international partners



WFEO Engineering 2030 – Partnerships for SDGs



The Plan is based on a quadruple interaction of government, academia, industry and professional engineering institutions which is best described in the Quadruple Helix Model



Engineering 2030 – Principles for Action

1. **Encourage young people** – To consider engineering as a career
2. **Graduate Outcomes** - Agree with educators, government, industry
3. **Global standards** - for engineering education and professional development
4. **Partnerships** – with international standard setting organisations for consistent international framework
5. **Support** – development of national engineering education systems to comply with agreed standards
6. **Capacity Building** – for accreditation of engineering education and accreditation bodies
7. **Capacity Building** – for professional engineering institutions
8. **Develop professional development pathways** – so graduates meet employer needs
9. **Support national and international registration** – for recognition of qualifications and experienced of practising engineers
10. **Liase with governments** – to establish consistent regulation policies for engineers
11. **Establish an international platform for engineering standards** – Education and professional development, under auspices of WFEO and UNESCO
12. **Report on progress** - to UNESCO and other international organisations

Engineering for Sustainable Development



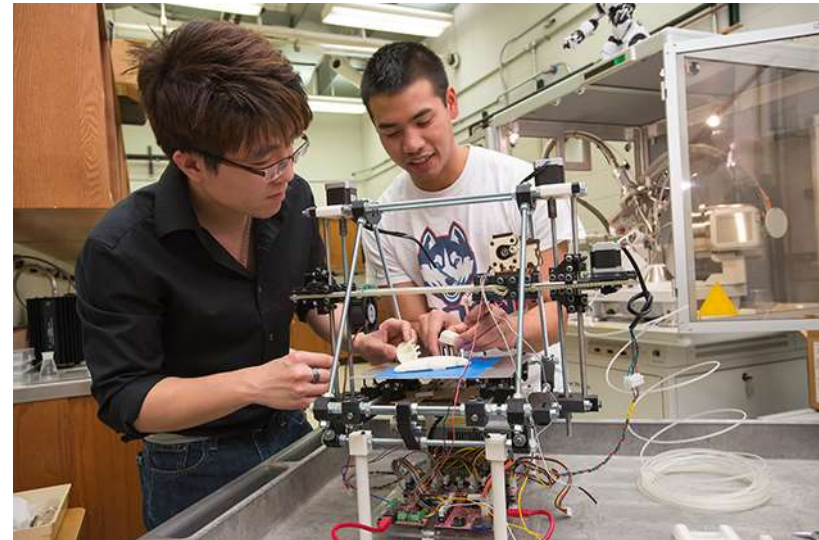
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Engineering 2030 – Engineering Education and Professional Development

1. **Supporting High Quality Education**
2. **Graduate Outcomes** that meet industry needs
3. **Engineering qualifications** that are recognised nationally and internationally
4. **Continuous professional development**
5. **Capacity Building** – for professional engineering institutions
6. **Support national and international registration** – for recognition of qualifications and experienced of practising engineers
7. **Liase with governments** – to establish consistent regulation policies for engineers
8. **Establish an international platform for engineering standards** – under auspices of WFEO and UNESCO



Engineering for Sustainable Development



WFEO Engineering 2030 – Partnerships

- 1. UNESCO and other UN bodies – Member major UN Science & Technology Group**
 - WFEO UNESCO Paris Declaration, 4 March 2018
- 2. WFEO Standing Technical Committees – support aspects of the plan, e.g. ethical engineering practices, diversity, youth leadership**
- 3. National and International Members of WFEO – These are the professional engineering institutions that will both deliver and benefit from the Plan**
- 4. International partners of WFEO – Key bodies for international standards in engineering education**
 - International Engineering Alliance (IEA)
 - International Federation of Engineering Education Societies (IFEES)
 - Federation of International Consulting Engineers (FIDIC)
 - International Network for Women Engineers and Scientists (INWES)
 - International Centre for Engineering Education (ICEE, UNESCO Centre)
 - International Science Technology and Innovation Centre for South-South Cooperation (ISTIC, Malaysia, UNESCO Centre)
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Africa Working Group on Natural Sciences

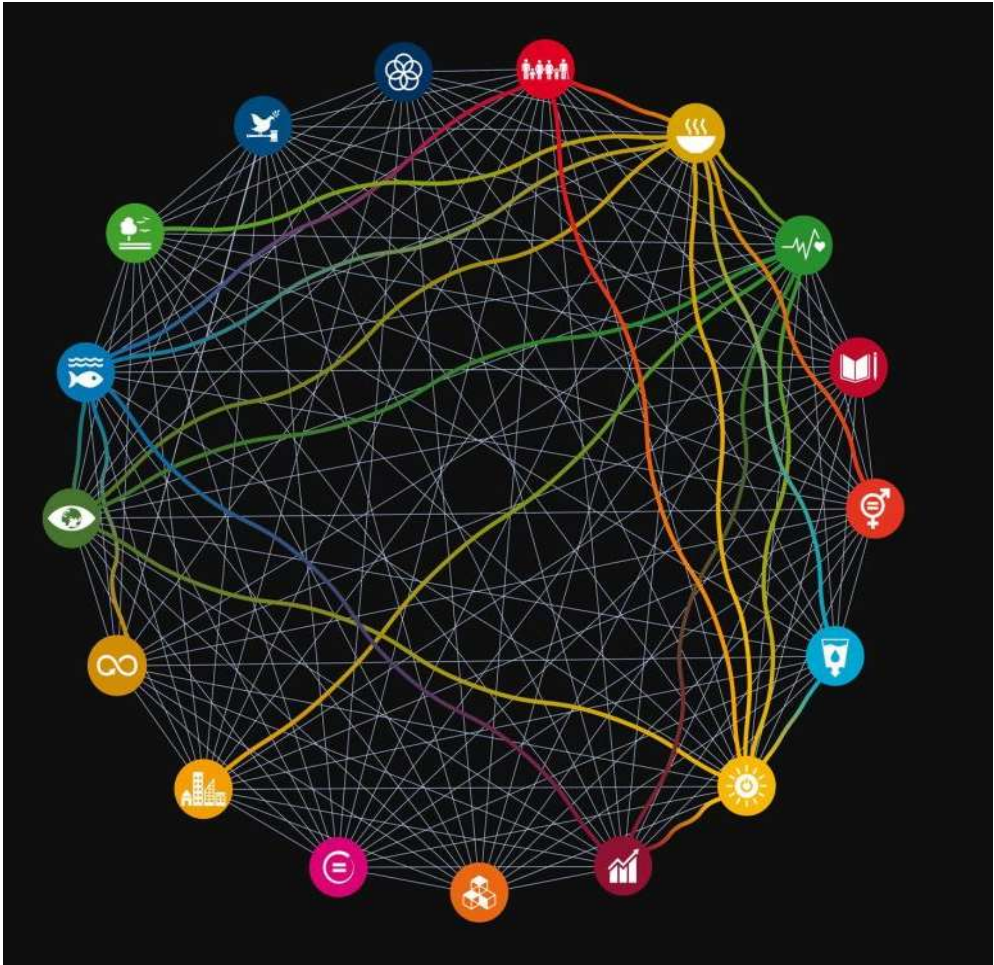
**Capacity Building and Engineering Activities in Africa
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**Speaker Name:
Prof. Gong Ke
President Elect WFEO**

Engineering for Sustainable Development

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Engineering is essential to achieve the UN SDGs



Source: Image from International Science Council

Engineering for Sustainable Development



WFEO – UNESCO
Declaration, signed on March 7, 2018



WFEO / FMOI

Paris Declaration

**Advancing the United Nations
Sustainable Development Goals
through Engineering**



The World Federation of Engineering Organizations (WFEO) is the main body for engineering globally, representing nearly 100 nations and some 30 million engineers.

The members of WFEO are the national and regional professional engineering institutions of the world. WFEO is a member of the United Nations Scientific and Technological Community (UN STC) Major Group and has an official Associate status with UNESCO.

UNESCO, as the United Nations agency for education, science and culture, supports engineering through its Natural Sciences Sector, and acknowledges engineering as a powerful means to achieve sustainable development, capacity-building in engineering education and gender equality in developing countries, as well as the safeguarding of world heritage.

CELEBRATING 50 YEARS OF INTERNATIONAL ENGINEERING LEADERSHIP

WFEO / FMOI
Maison de l'Unesco - 1 rue Miollis, 75015 Paris, France - Tel : +33 (0) 1 45 68 48 46
secretariat@wfeo.org - www.wfeo.org

Engineering for Sustainable Development



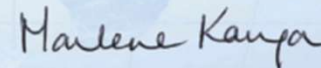
Considering that:

1. In September 2015, the United Nations General Assembly adopted its Resolution 70/1 announcing the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), which take an integrated approach to future development, combining progress in economic prosperity, social inclusion and environmental sustainability.
2. Engineers and engineering are critical for achieving the SDGs. Engineers have a key role in supporting the growth and development of essential infrastructures such as: roads, railways, bridges, dams, waste management, water supply and sanitation, energy and digital networks. They are responsible for developing and implementing technologies and systems that contribute towards achieving the SDGs as they relate to water, energy, environment, sustainable cities, natural disaster resilience and other areas, which will benefit people and the planet for greater prosperity and better quality of life.
3. WFEO is committed to playing a key role in leading and coordinating projects to achieve the SDGs through engineering. WFEO can bring together its members, educational institutions, government and industry to address the need for engineering capacity and the quality of engineers around the world and develop strategic frameworks and best practices for the implementation of engineering solutions for sustainable development. The national and regional members of WFEO, that are leading professional engineering institutions, will develop country and region-specific responses.
4. The celebration of WFEO's 50th anniversary in 2018 is a catalyst to develop a framework for an action plan for the engineering capacity that is required to achieve the SDGs. The Symposium held today, on 7th March 2018, is the first stage in bringing together the WFEO members and partners to develop the *WFEO Engineering 2030 Plan*.

Accordingly, we declare:

1. WFEO, a recognized member of the UN STC Major Group and UNESCO, through its Natural Sciences Sector, will work together and in cooperation with other UN organizations, including UNEP, UNFCCC and UNISDR towards achieving the SDGs through engineering.
2. WFEO and UNESCO are committed to the following principles for action through engineering to achieve the SDGs:
 - a. Increase the numbers and quality of engineering graduates that meet the needs of sustainable development with rapidly changing technologies, in collaboration with educators, government and industry;
 - b. Inform global standards for engineering education, support the development of a range of engineering education systems to comply with agreed standards and facilitate the mobility of engineers;
 - c. Support capacity-building through strong institutions for engineering education and the development of accreditation bodies for the recognition of professional credentials;
 - d. Establish policy frameworks and best practices, notably through WFEO Standing Technical Committees, as digital technologies, data sciences and artificial intelligence have ethical and social implications.

Signed in Paris, 7 March 2018



Marlene Kanga
President
World Federation of Engineering Organizations



a.i. Flavia Schlegel
Assistant Director-General for Natural Sciences
UNESCO



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WFEO is working with global partners to develop position papers and policy frameworks that meet future needs of society.

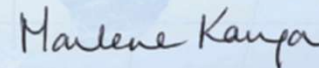
Accordingly, we declare:

Engineering is critical to implementing solutions to advance the UN SDGs

WFEO will lead the world's engineers in co-ordinating projects that achieve the UN SDGs

- c. Support capacity-building through strong institutions for engineering education and the development of accreditation bodies for the recognition of professional credentials;
- d. Establish policy frameworks and best practices, notably through WFEO Standing Technical Committees, as digital technologies, data sciences and artificial intelligence have ethical and social implications.

Signed in Paris, 7 March 2018



Marlene Kanga
President
World Federation of Engineering Organizations



a.i. Flavia Schlegel
Assistant Director-General for Natural Sciences
UNESCO

WFEO Participation @ UN to High Level Political Forum and Science Technology Innovation Forum



- STI-Forum June 2018, UN New York, 2 side events
- HLPF July 2018 UN New York, 3 side events

Engineering for Sustainable Development



WFEO Participation @ UN to High Level Political Forum and Science Technology Innovation Forum

Systems Analysis and Capacity Building for Transformative Change toward Achieving the SDGs and long-term sustainability

Intergenerational Dialogue, Capacity Building and Lifelong Learning in STI

Effective tools employed by Major Groups and other Stakeholders in the 2030 Agenda implementation, follow-up and review

Managing SDG interactions

STC for Sustainable and Resilient Societies

- **STI-Forum June 2018, UN New York, 2 side events**
- **HLPF July 2018 UN New York, 3 side events**



WFEO NETWORKING@ COP24



COP24 · KATOWICE 2018
UNITED NATIONS CLIMATE CHANGE CONFERENCE

“Engineers need to mobilise and implement feasible solutions to existing and future built infrastructure systems.”





WFEO Model Code of Practice

for Sustainable Development and Environmental Stewardship

Think Global and Act Local

1. Maintain and continuously improve awareness and understanding of environmental stewardship, sustainability principles and issues related to your field of practice.
2. Use expertise of others in the areas where your own knowledge is not adequate to address environmental and sustainability issues.
3. Incorporate global, regional, indigenous and local societal values applicable to your work, including local and community concerns, quality of life and other social concerns related to environmental impact along with traditional and cultural values.
4. Implement sustainability outcomes at the earliest possible stage employing applicable standards and criteria related to sustainability and the environment.
5. Assess the costs and benefits of environmental protection, eco-system components and sustainability in evaluating the economic viability of the work, with proper consideration of climate change and extreme events.
6. Integrate environmental stewardship and sustainability planning into the life-cycle planning and management of activities that impact the environment, and implement efficient, sustainable solutions.
7. Seek innovations that recognize environmental, social and economic factors while contributing to healthy surroundings in both the built and natural environment.
8. Develop locally appropriate engagement processes for stakeholders, both external and internal, to solicit their input in an open and transparent manner, and respond to all concerns – economic, social and environmental in a timely fashion in ways that are consistent with the scope of your assignment. Disclose information necessary to protect public safety to the appropriate authorities.
9. Ensure that projects comply with regulatory and legal requirements and endeavour to exceed or better them by the application of best available, economically viable methodologies, technologies and procedures for stakeholders.
10. Where there are threats of serious or irreversible damage but scientific certainty is lacking, implement risk mitigation measures in time to minimize environmental degradation.





Model Code of Practice:
Principles of Climate Change Adaptation for
Engineers

Prepared by:

WFEO Committee on Engineering and the Environment

December 2015

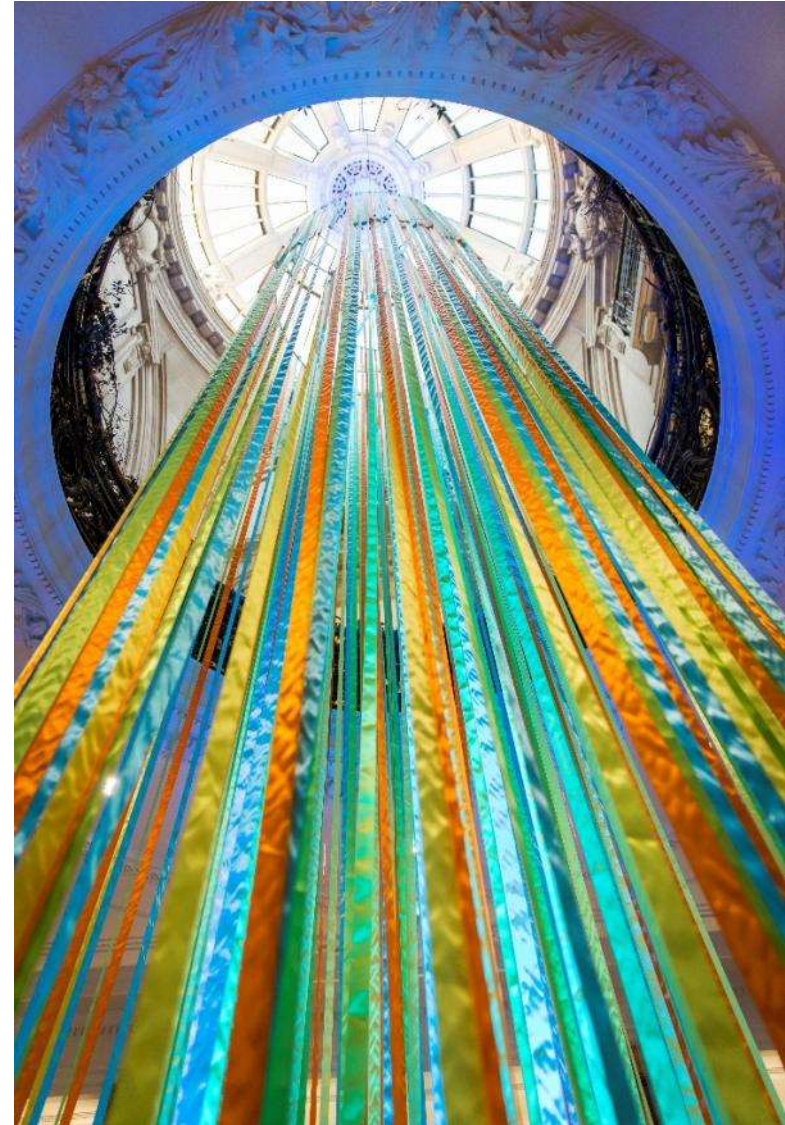


UNIDO meetings AI and Data Project



All WFEO Conferences and Events focus on selected of the UN Sustainable Development Goals

Reaching for solutions for the UN
SDGs Water, Energy, Innovation,
Sustainable Infrastructure and
Climate Change at GEC2018, as
well as WEC2019, WCF2019, etc.



Engineering for Sustainable Development



Message of Congratulations from UN Secretary
General Antonio Guterres to the Global
Engineering Congress, 22-26 October 2018



*“The United Nations will continue to count on your engagement and support as we strive to achieve the 17 Sustainable Development Goals – the world’s blueprint for building a future of peace and prosperity for all on a healthy planet. **Every one of the Goals requires solutions rooted in science, technology and engineering.** I am therefore pleased that the focus of this Global Engineering Congress is to advance the goals relating to **water, energy, infrastructure and cities.**”*



Engineering 2030 – Projects in hand



1. **ENGINEERING EDUCATION STANDARDS (SDG4):**

Reviewing and Developing Standards for Engineering Education to meet current and future needs of industry and society

- **Engineers to meet industry needs** – increase employability and continuing professional development
- **Improve mobility of engineers in the region** – where they are needed

2. **CAPACITY BUILDING FOR ENGINEERING (SDG4):**

Capacity Building for Engineering Education Systems, accreditation and registration to meet the needs for engineers around the world

- **Engineering Education standards:** mentoring and support for educational Institutions, development of accreditation bodies
- **Professional Engineering Institutions** – Establish and develop professional engineering institutions including governance, leaderships training and systems
- **Regulation of engineers** – Review best practice models and liaise with government
- **National and international registration of engineers** – registers to recognise qualifications and ongoing professional development of engineers, will also support mobility



Engineering 2030 – Projects in hand

3. WOMEN (SDG5): Facilitate the work being done to encourage girls to consider STEM careers by WFEO associate, **WomEng, South Africa**



4. WORLD COUNCIL OF CIVIL ENGINEERS (international member)

(SDG6) : World Council of Civil Engineers facilitate the work being done to advance UNSDG6: Water through the Water Monographies



5. SPAIN AND PORTUGAL (National member) (SDG6): The Institution of Engineers Spain (IIE), the Order of Engineers Portugal (OdE) and the World Council of Civil Engineers (WCCE) have combined to develop strategies and programmes to address the severe drought in the Iberian Peninsula and to develop sustainable solutions to integrated water management.

6. BAHRAIN SOCIETY OF ENGINEERS (national member) (SDG 4, 9): The Cyber School, Collaborative effort to create an online global interactive remote teaching K-12



7. WFEO Committee for Engineering and Innovative Technologies

(SDG9): Innovative Technologies Assisting Disaster Risk Reduction - the International Meridian Circle Project

Engineering for Sustainable Development



Engineering 2030 – Projects in hand

8. **FIJI (National member) (SDG11):** Sustainable Infrastructure and Resilience to Natural Disasters in Small Island Developing States



9. **WFO Committee of Disaster Risk Management (SDG 13):** Piura River, Peru, Early Warning System – Resilience Against Natural Disasters

10. **WFO Committee on Anti-Corruption (SDG16):** Partnerships for Governance, Anti-Corruption and Strong Institutions



Engineering 2030 – STC Projects

1. **WFEO Committee on Disaster Risk Management** – capacity building for natural disasters mitigation.
2. **WFEO Committee on Engineering Education** – biennial conferences on engineering education and publication of IDEAS journal.
3. **WFEO Committee on Information and Communication** – international seminars on implementation in technologies for Smart Cities and the Internet of Things
4. **WFEO Committee on Energy** – international World Energy Forum and publication on solar energy
5. **WFEO Committee on Engineering Capacity Building** – facilitation of capacity building in engineering including Africa Engineering Week, held annually
6. **WFEO Committee on Engineering and the Environment** – Codes of Practice for Sustainable Development and Environmental Stewardship for Engineers and participation in the UN Conference of Parties (COP) events
7. **WFEO Committee on Engineering for Innovative Technologies** – international conferences and seminars on artificial intelligence, use of innovative technologies
8. **WFEO Committee on Women in Engineering** – survey on the status of women engineers in Africa and work on improving sanitation for women in Africa.
9. **WFEO Committee on Anti-Corruption** – contribution to the ISO 37001 Anti Bribery Standard, ongoing participation in the ISO technical committee
10. **WFEO Young Engineers/Future Leaders Committee** - supporting young engineers including the inaugural Young Engineers Competition held in 2018.

Engineering for Sustainable Development



Reporting on progress in advancing the 2030 UN Agenda with a focus on young engineers



Engineering for Sustainable Development



Africa Working Group on Natural Sciences

**Capacity Building and Engineering Activities in Africa
31st January 2019**

Speaker Name:

Eng Mustafa Shehu

Chair WFEO Awards Committee

Past President Nigerian Society of Engineers

Past President Federation of African Engineering Organisations

Engineering for Sustainable Development

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WFEO in Africa

WFEO in Africa

Africa is a priority for WFEO. WFEO is convinced of the role that qualified engineers play in underpinning economic and social development, and that is particularly the case in sub-Saharan Africa.



WFEO-FAEO Abuja Declaration December 2013

- On the 10th December 2013, the WFEO and FAEO leadership signed a Declaration in Abuja that:
- With the understanding that a well established professional engineering corps is essential to plan, construct, operate and maintain infrastructure in Africa, it is in the common interest of the two Federations to among other things:
- Assist in improving the functioning of professional engineering organizations in Africa
- Assist Countries where there are no professional engineering organisations in creating such Organisations



FAEO MoU with African Union

On 15th December 2016, the FAEO signed a MoU on Technical co-operation with the African Union Commission towards:

- Building capacity in engineering by strengthening Engineering Institutions, Women and Young Engineers, to develop skilled manpower capable of working to achieve the SDGs in Africa
- Harmonised qualification framework for ease of mobility within Africa and outside the continent
- Creation of standards and infrastructure codes for common application in Africa



Recognition of WFEO in Africa

Strengthened by the instrumentality of FAEO, there are **23 engineering Institutions from Africa that are Members of WFEO**. Their participation is so pronounced that attracted the following recognitions:

- 3 out of 10 WFEO Standing Technical Committees (STCs) are chaired by Africans
- In addition to the 3 chairs of STCs above the FAEO President and myself (as Chair of Awards Committee) are members of the Executive Council
- With support of President Marlene Kanga, the WFEO has approved Kigali, Rwanda as host of the 2020 WFEO Executive Council and Engineering Conference
- Through discussions between WFEO, Royal Academy of Engineering and FAEO, Africa Catalyst Programme is now going on which sees to the execution of projects by PEIs in Africa sponsored by Global Challenges Research Funds from UK.
- WFEO in collaboration with UNESCO initiated the Africa Engineering Week which the FAEO has keyed into by taking increasingly active and important role to extent of making a conference and holding its General Assembly or Executive Council Meetings during the period. So far, we had conferences in South Africa, Zimbabwe, Nigeria, Rwanda and Kenya.



Need for further growth and participation from Africa

With 54 independent countries in Africa, 23 country representation at WFEO is certainly not good enough! The increased number of members will make our voice louder at WFEO events,

Consequently the following efforts are being made to create Engineering Institutions where there are none and strengthening existing Institutions:

- Strengthening FAEO Secretariat in Abuja
- Reaching-out to other countries, especially the franco-phone countries, many of which are not registered with FAEO and WFEO.
- Reaching out to National Members through rotational Executive Council meetings, Conferences.
- Developing capacity building programmes for Young and Women Engineers across the continent



AFRICAN INFRASTRUCTURE OPPORTUNITIES

- Huge opportunity in Africa to contribute to infrastructure provision and development
- Infrastructure deficit in Africa currently amounts to \$1.5 trillion

(Source: African Development Bank VP: Professor Mthuli Ncube).

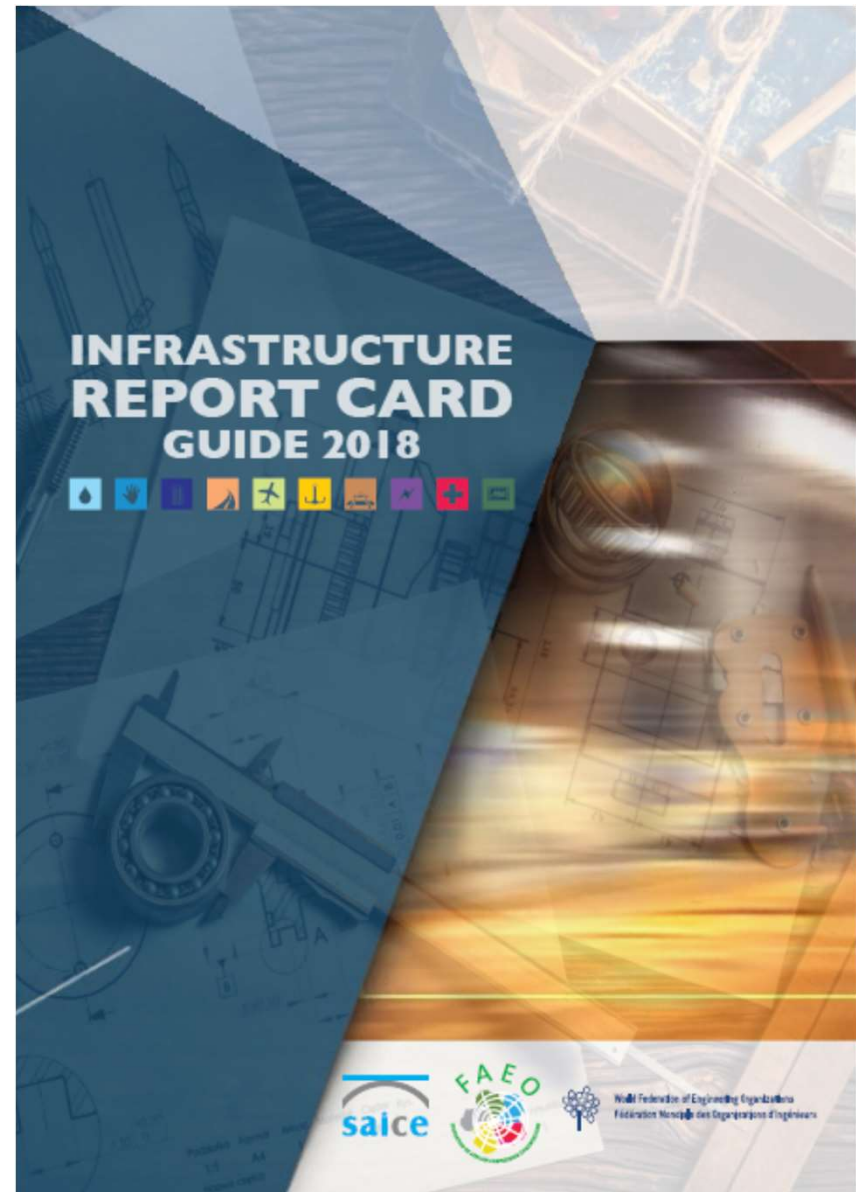
- WFEO through its International Member FAEO, has instituted the Infrastructure Scorecard Project. Its being led by Dr. Martin van Veleen of South Africa.

- Energy
- Development of Roads
- Airline Industry
- Railway Networks
- Affordable housing and townships
- Telecommunication
- Water and Sewerage treatment plans
- Dams
- Hospitals
- Schools



Infrastructure Report Card to identify the status of national infrastructure for policy makers

This will be important in guiding the development of infrastructure to common codes and standards



Africa Working Group on Natural Sciences

**Capacity Building and Engineering Activities in Africa
31st January 2019**

Speaker Name:

Eng Martin Manuwha

Chair WFEO Committee for Anti Corruption

Chair Engineering Council of Zimbabwe

President Federation of African Engineering Organisations

Past President Zimbabwe Institution of Engineers

Engineering for Sustainable Development

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WFEO in Africa

- WFEO has **18 national members in Sub-Saharan Africa** Cameroon, Democratic Republic of Congo, Ethiopia, Ghana, Ivory Coast, Kenya, Madagascar, Malawi, Mauritius, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Uganda, Zambia, Zimbabwe,
- One international member: the FAEO (Federation of African Engineering Organizations).
- **Nigeria, South Africa and Zimbabwe**, are currently host of a Standing Technical Committee: Capacity Building, Anti-corruption and Women in Engineering, and, as such, their chairs are members of WFEO Executive Council.
- **Federation of African Engineering Organisations (FAEO)**, as international member, headquartered in Nigeria, also has a seat at the WFEO Executive Council.



FAEO Vision and Mission

- **Vision**
- FAEO is recognized by international organizations as the overall leader of the engineering profession in Africa and sets out to apply engineering for the benefit of mankind.
- **Mission**
- To serve humanity through the use of best practiced technology.
- To represent the engineering profession in Africa, internationally.



Africa Engineering Week 2019

We have send out calls to host to all the WFEO-FAEO Members in Africa.

Call to Host the 6th UNESCO Africa Engineering Week 2019 & 4th Africa Engineering Conference.

By United Nations Educational, Scientific and Cultural Organisation (UNESCO), the World Federation of Engineering Organisations (WFEO) and the Federation of African Engineering Organisations (FAEO).



FAEO CIRCULAR 01/19

DATE 02 JAN 201

Engineering for Sustainable Development



AEW 2018

- The **Institution of Engineers Kenya** in collaboration with the Federation of African Engineering Organisations (FAEO) hosted the African Engineering Conference in Mombasa, Kenya, between 17 and 21 September, with the support from **UNESCO** and guidance from **WFEO**.
- The Theme of the Conference, “Harnessing Blue Economy for Accelerated Economic Growth”, is in line with the United Nations Sustainable Development Goal No. 14 on life in the sea.



Engineering for Sustainable Development



Africa Engineering Week Activities

- Workshops on capacity building for engineering education
- Workshops on the development of national Infrastructure Report Cards
- Workshops on Corruption Prevention organised by the WFEO Anti-Corruption Committee,
- African Women Engineering Forums to support women in engineering,
- Meetings of FAEO and its regional bodies (SAFEQ, WAFEO, EAFEO, NAFEO and CAFEO),
- Educational activities for high school students
- Public awareness events, such as Family Fun Day
- Mentoring events, such as Introduce a Girl to Engineering Day
- University - led activities and events, such as lectures in conjunction with university students
- Involvement of industry and government through the Ministries of Higher and Tertiary Education, Science and Technology and other relevant departments

- Some activities listed above are implemented during the Africa Engineering Week Conference, while others are carried out in the rest of the African Countries across the continent.



Mombasa Declaration Sept. 2018



**5th UNESCO Africa Engineering Week (AEW), 3rd Africa
Engineering Conference (AEC) 2018 & 25th IEK Conference
17th -21st September 2018**

Mombasa Declaration on Harvesting Blue Economy for Accelerated Economic Growth.

Preamble:

The participants at the 5th UNESCO Africa Engineering Week (AEW), 3rd Africa Engineering Conference (AEC) and the 25th IEK Conference on "Harvesting Blue Economy for Accelerated Economic Growth", held in Mombasa, Kenya, from September 17th -21st, 2018, discussed the current state, future, and expected innovations of the various fields of engineering with regard to the blue economy and other issues facing the world and humanity, and the relationship between these problems and national development with emphasis on Africa in general and Kenya in particular. The participants applauded Kenya's big four agenda strategy and its effort towards

Engineering for Sustainable Development



WFEO Committee for Anti Corruption

- Our vision is to promote zero tolerance to corruption. This will reduce corruption in engineering projects and practice through the enforcement of sound **management systems** and **ethical professional practice**.
- Our Mission Statement is to **execute** thematic, results-oriented programmes that **raises ethics and corruption prevention awareness and increases the understanding of the global, regional, engineering and policy issues** and solutions for the **combating of corruption** to induce transparency in infrastructure and other vital services.



WFEO Networking@ OECD Integrity Forum



- UN SDG 16 : Improving governance
- Fostering ethical engineering practice
- Supported development of ISO 37000 Anti Bribery and Governance Standards
- Training and development programs

Engineering for Sustainable Development



WFEO Networking@ IACA



International Recognition of CAC & WFEO by IACA the UN Anti-corruption Academy



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WFEO Networking@ World Justice Forum



World Justice Forum V 2017

2/6/2019

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Engineering for Sustainable Development



Africa Working Group on Natural Sciences

**Capacity Building and Engineering Activities in Africa
31st January 2019**

Speaker Name:

Ms. Valerie Agberagba

Chair WFEO Committee for Women in Engineering

Past Vice President Nigerian Society of Engineers

Past President of the Association of Professional Women

Engineers of Nigeria (APWEN)

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WFEO Committee for Women in Engineering established in 2007



- Attract women and girls to engineering
- Mentor and support women in the engineering work force
- Recognise achievements with awards

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WFEO Committee for Women in Engineering – Our Themes

All our activities are geared towards achieving these 3 themes.



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WFEO Committee for Women in Engineering – Our Themes

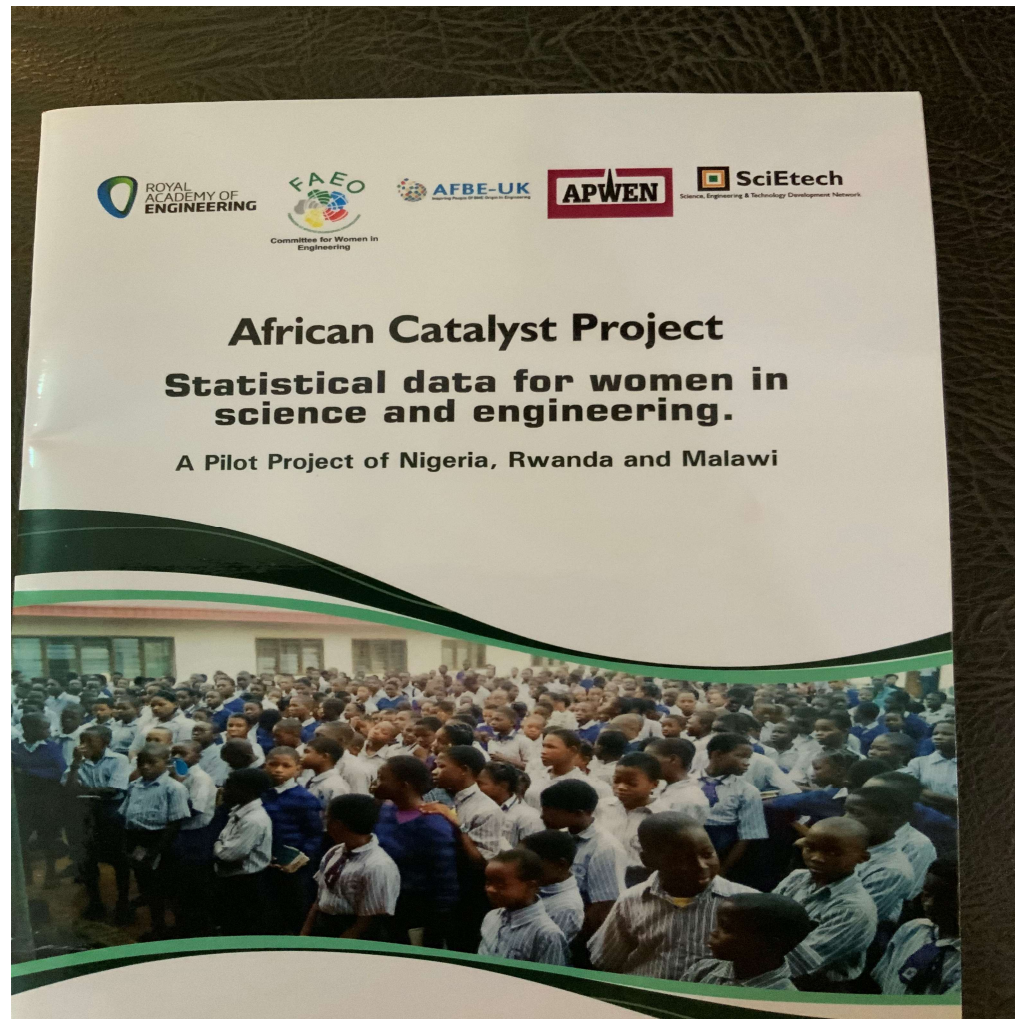


Theme 3: Focus on Africa

- Africa seems to have the least data on women in engineering & technology;
- Research was focussed on West(Nigeria), East(Rwanda) and South Africa(Malawi).
- Project executed under the Federation of African Engineering Organizations, FAEO
- Funded by the Royal Academy of UK



Theme 3: Focus on Africa



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Survey Areas & Findings

Survey Covered Areas



- Demography(gender& Social
- Preference for SET
- Factors influencing students choices
- Students' attitude & perception of SET

Findings



- Female students loose interest vin mathematics at senior secondary level
- Good teaching methods positively influenced female participation in SET subjects
- Lack of visible role models for the female students in SET across the countries
- No career guidance and counselling for students s except Malawi



Working with Goal No 6 on Water and Sanitation Project

- **TARGET 6.2**

By 2030, achieve access to adequate and equitable sanitation and hygiene **for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations**

Gaba1 & 2 Community in FCT, Nigeria

A Community Led Total Sanitation (CLTS) project which involves four stages:

- Pre Triggering
- Triggering
- Monitoring & Evaluation
 - i. Formation of WASHCOM
 - ii. Hygiene promotion & sanitation Marketing
 - iii. Establishing WASHCOM in Schools
- Achieving ODF Status



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Africa Women's Forum at AEW



- Inaugural Forum for Women Engineers in Africa in September 2018
- Resolved to work with the goals that will impact on gender equality & poverty reduction
- Seek funds to encourage research and innovation and build capacity through mentoring
- Encourage communication with the semi skilled women in technology in order to improve capacity

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Working with WomEng (South Africa) -WFEO Associate –Project for 1 million girls into STEM



Bwari, Abuja, Nigeria



Mombassa, Kenya



Helping to fund education

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GREE Women in Engineering Award



- First presented in October 2018, to be presented annually.

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SAGA

(STEM and Gender Advancement)

Improved Measurement of Gender Equality in Science and Engineering

A Global UNESCO Project, with the support of Sida



- Dr. Marlene Kanga AM is a member of the SAGA International Advisory Council – WFEO to promote implementation
- Tool kit for Statistical data for Women in STEM
- Tool kit for identifying policy gaps to support women in STEM
- Tested in 8 countries

Engineering for Sustainable Development



Africa Working Group on Natural Sciences

**Capacity Building and Engineering Activities in Africa
31st January 2019**

**Speaker Name:
KAZAWADI PAPIAS DEDEKI
PRESIDENT AND CHAIRMAN GOVERNING COUNCIL
INSTITUTION OF ENGINEERS RWANDA**

Engineering for Sustainable Development

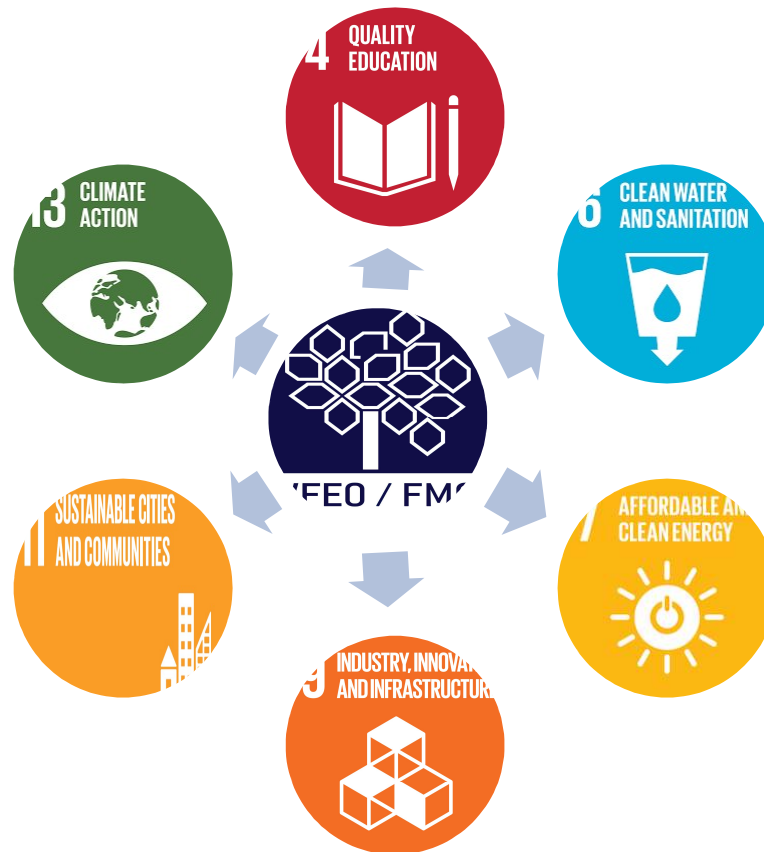
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Rwanda to host WFEO Conference and Executive Council in 2020

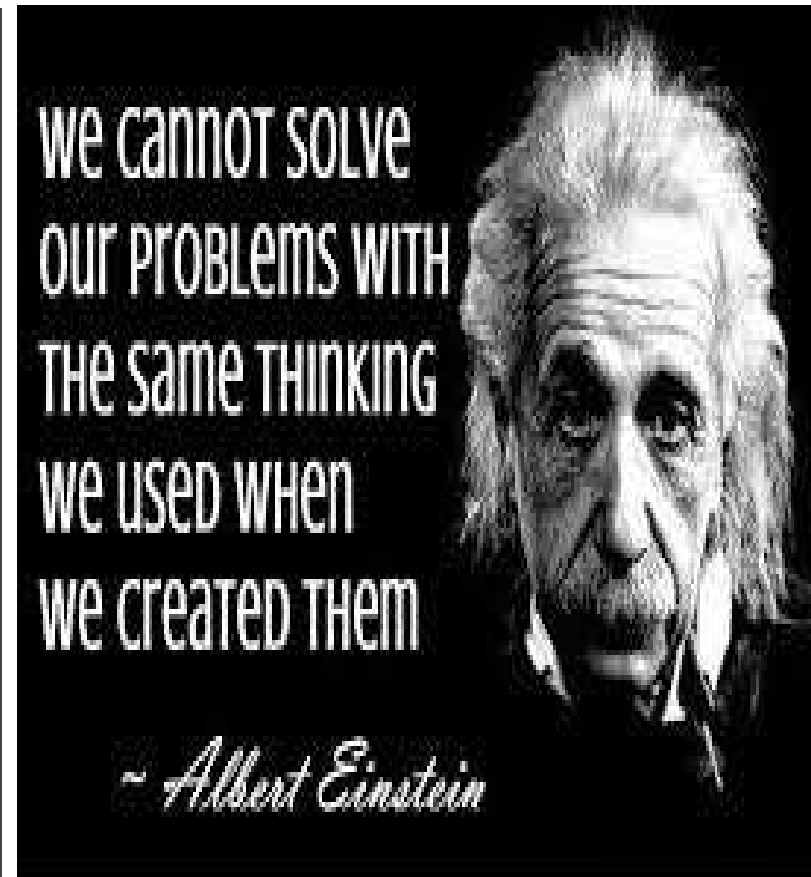
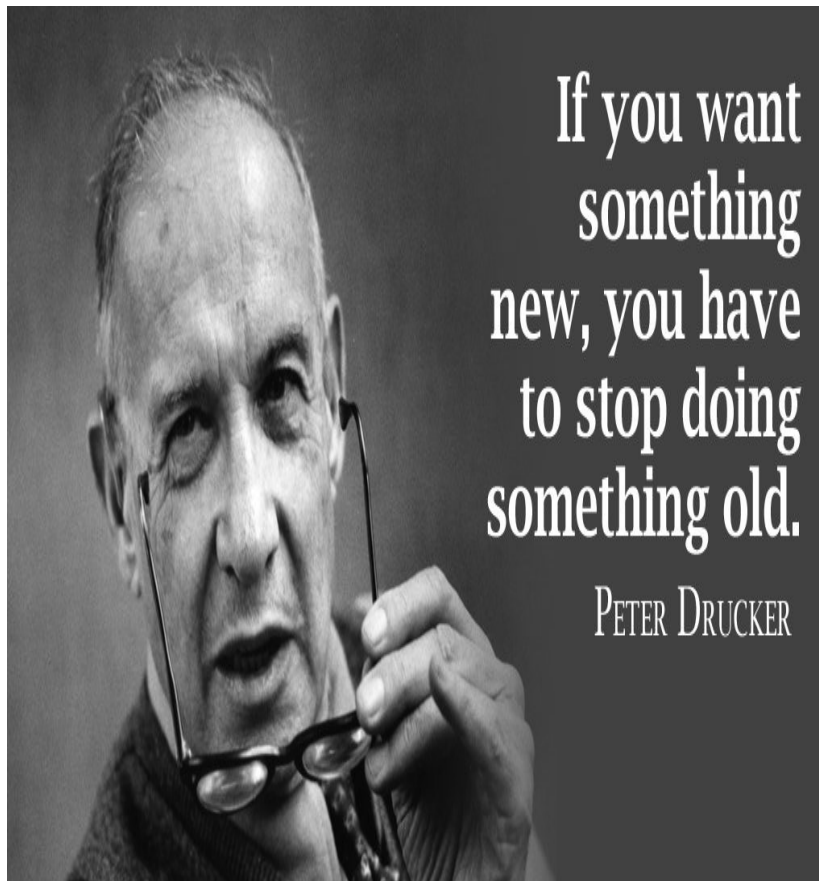
- **Location:** Rwanda is ranked 3rd in Africa by International Congress and Convention Association (ICCA) after South Africa and Morocco respectively
- **Theme:** ENGINEERING CAPACITY BUILDING FOR AFRICA'S ECONOMIC TRANSFORMATION WITH RESPECT TO INFRASTRUCTURES, CLIMATE ACTION, AND HARNESSING INDUSTRIAL 4.0 REVOLUTION
- **Purpose:** WHERE WILL AFRICA BE IN RESPECT TO THE INDUSTRIAL REVOLUTION AND IMPLEMENTATION OF SDGs 4, 6, 7, 9, 11 AND 13



WHAT? Collaborative Framework with Engineering Bodies



WHY? “In God we trust, all others bring data” by W. Edward Deming

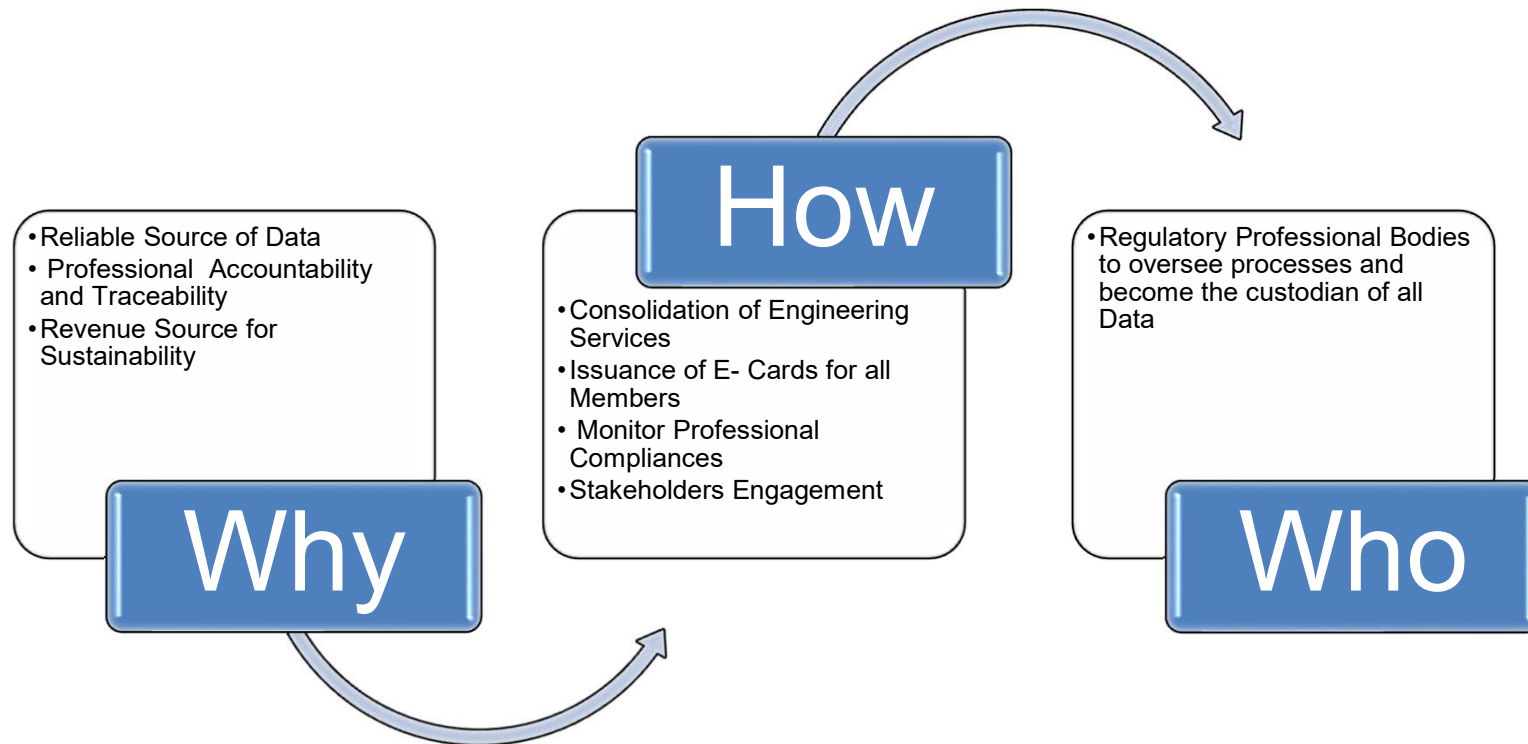


www.MyLuckyQuotes.com



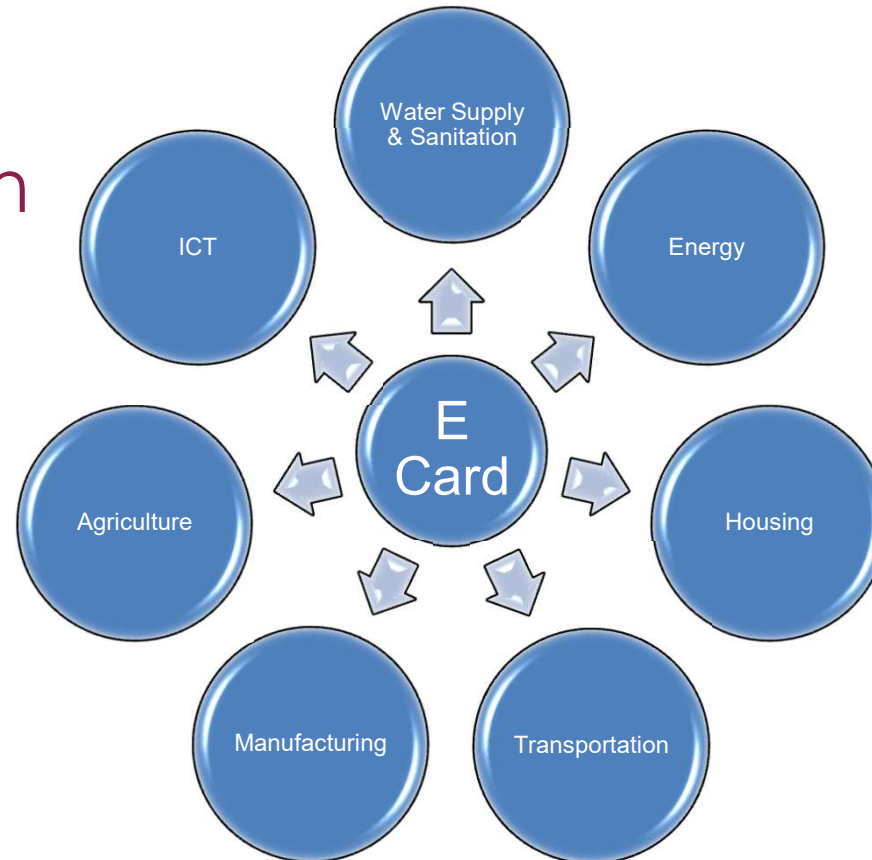
Institution of Engineers Rwanda – Registration project

Digitization is a Game Changer!



OUTCOMES? Consolidated and Enhanced Services Delivery

SDGs
Implementation
Monitoring &
Evaluation



Africa Working Group on Natural Sciences

**Capacity Building and Engineering Activities in Africa
31st January 2019**

Speaker Name:

**Jacques de Mereuil
WFEO Executive Director**

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A few words on...Africa Hydrology Training Program

- A collaborative project with 7 NGOs
- Funding from UNESCO Participation Program
- Local NGOs propose technician candidates with field projects
- Projects endorsed by UNESCO National Commissions
- Best candidates selected for a training program at 2iE (Ouagadougou, Burkina Faso)
- Students go back home and implement their local project (wells, sanitation systems, education...)



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Africa Hydrology Training Program - implémentation

- **First session in 2016-17. 14 students (7 men, 7 women) from 3 countries (Congo DR, Ivory Coast, Madagascar)**
- **Second session is ongoing (2018-2019): call for projects extended to 6 countries (Burkina Faso, Cameroon, Niger, Senegal, Tchad and Togo) and 30 students (14 men, 16 women)**



NGO liaison committee UNESCO
international conference

Engineering for Sustainable Development



Proposal for World Engineering Day for Sustainable Development

- 1. 4 March each year – the founding day of WFEO in 1968**
- 2. Opportunity to focus on engineering**
 - technologies for climate change action and sustainable development
- 3. Important in Africa – need for infrastructure for development:**
clean water and sanitation,
 - mitigate the impacts of climate change,
 - grow more food,
 - protect our oceans and our earth resources
 - develop new technologies
- 2. Importance of engineering for economic growth**
- 3. Encourage young people to consider engineering**
- 4. Raise the profile of the contribution of women in engineering**
- 5. Dialogue between engineers and**
 - decision makers, industry leaders, NGOs and public



Proposal for World Engineering Day for Sustainable Development

- 1. Engineers are essential for resilience to climate change**
 - infrastructure against floods, cyclones, fires...
 - especially in Africa and SIDS
- 2. Enable capacity building in developing countries, especially Africa**
- 3. Support improvements in standards of engineering education**
- 4. Engage with government and industry to address the need for more engineers**
- 5. Promote the importance of engineering innovation and international cooperation**



The importance of the World Engineering Day for Sustainable Development

- 1. UNESCO Strategic Priority for Climate Change Action**
- 2. COP 21 Paris Agreement national obligations**
- 3. A strong focus on key priorities :**
 - Africa, Education, Gender Equality, SIDS...
- 2. Support important UNESCO programmes**
 - Hydrological (IHP),
 - Geoscience (IGCP),
 - Ocean (IOC)
 - Man and the Biosphere (MAB) etc
- 3. Highlight engineering efforts in other UN agencies: UNIDO, UNISDR, UNDP**
- 4. Follow up and strengthening of UN STI years...**
- 5. ...and days, such as International Day of Women and Girls in Science**



World Engineering Day for Sustainable Development : where are we ?

1. **Widespread support** from peak international engineering bodies
2. Some **75 letters of support** from institutions representing more than 23 million engineers
3. **WFEO would lead celebrations** but other institutions also expected to celebrate in their own countries
4. **Communications and Sponsorship plan** to ensure sustainable global celebrations for future years
5. Our objective is to have this proposal on the **agenda of the next UNESCO Executive Board in April 2019**



World Engineering Day for Sustainable Development : Why Africa should support

1. Support for World Engineering Day is in sync with the **Africa Union Agenda 2063 National Development Agenda**
2. Recognises that Engineering is a **crucial driver for economic development** in Africa
3. Enables engagement with government and policy makers on the importance of **engineering as the “missing link” in the development program**
4. Support **capacity building in engineering** to drive the development agenda:
 - Increase the number of engineers
 - Improve the quality of engineering education and professional training
 - Strengthen professional engineering institutions





WFEO / FMOI

Science is the Seed - **Engineering is the tree that bears the fruits** of scientific discoveries – essential for a modern sustainable world.

Engineering for Sustainable Development

