



THE GLOBAL ENGINEERING CONFERENCE ON SUSTAINABLE
DEVELOPMENT AND WORLD FEDERATION OF ENGINEERING
ORGANISATIONS EXECUTIVE COMMITTEE MEETINGS.

15th – 18th October 2024, Kigali, Rwanda

Theme: Engineering Innovations for a Sustainable Future

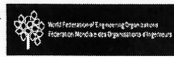
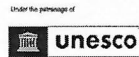
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THE GLOBAL ENGINEERING CONFERENCE ON SUSTAINABLE DEVELOPMENT GOALS AND WORLD FEDERATION OF ENGINEERING ORGANIZATIONS EXECUTIVE MEETINGS RESOLUTIONS

DATE : 15-17 OCTOBER 2024

VENUE: KIGALI CONVENTION CENTRE

Conference Resolutions

PREAMBLE

The Global Engineering Conference on Sustainable Development Goals and the World Federation of Engineering Organizations (WFEO) Executive Meetings was held from October 15th to 17th, 2024, in Kigali, Rwanda.

This high-level three-day event attracted over 700 delegates from around the world and was organized by the Institution of Engineers Rwanda (IER) in partnership with WFEO and the Federation of African Engineering Organizations (FAEO).

The conference brought together high-profile officials, engineers, and experts from academia and the private sector to explore innovative solutions for a sustainable future under the theme “Engineering Innovations for a Sustainable Future.”

This event was the first of its kind held in sub-Saharan Africa and was described as historic and monumental. For the first time, policymakers and industry experts gathered to discuss their roles in positioning engineers as true champions of development.

The discussions focused on six Sustainable Development Goals (SDGs): Quality Education (SDG 4), Clean Water and Sanitation (SDG 6), Affordable and Clean Energy (SDG 7), Industry Innovation and Infrastructure (SDG 9), Sustainable Cities and Communities (SDG 11), and Climate Action (SDG 13).

A welcome address was delivered by Gentil Kangaho, the President and Chairperson of the governing council of the Institution of Engineers in Rwanda. He thanked all participants for their time and expressed hope for productive deliberations on the critical role engineering plays in achieving the Sustainable Development Goals (SDGs) set forth by the United Nations.

He reminded delegates that Rwanda bid to host the conference in 2017 and was scheduled to host it in 2020, but it was postponed due to the COVID-19 pandemic.

The conference featured keynote speakers, paper presentations, panel discussions, and question-and-answer sessions, making it more insightful and participatory.

Dr. Jimmy Gasore, the Minister for Infrastructure in Rwanda, officially opened the conference. He emphasized the importance of this moment for critical discussions, sharing insights, and exploring innovative solutions to some of the world's most pressing challenges.

The Minister commended the transformative role engineering play in achieving sustainable development—not just in Rwanda but globally. He praised the meeting organizers for creating avenues for conversations essential to people's daily lives and the well-being of future generations, noting that discussions focused on specific SDGs vital for collective futures.

We, as participants in the Global Engineering Conference on Sustainable Development and the WFEO Executives, commend the government of Rwanda for hosting this important conference and appreciate the high-level participation from government officials and experts.

The WFEO President's representative and Chair of the WFEO Capacity Building Committee, Eng. Martin Manuhwa called for the need for engineering to speak to policy issues. This will create a robust partnership framework with the UN system, the AU, our Governments and Business. Such a smart partnership framework will support a Capacity Building Engineering Program for Africa which will create an African Engineering Accord through Mutual Recognition Agreements for mobility of engineering Professionals among other outcomes.

  
2

REALISING THAT;

Engineering is the gateway to the actualization of the SDGs, the Agenda 2063 of the Africa we Want and the other Regional Aspirations.

Engineering Education and Skills are not coherently developed and harmonised to meet international benchmarks, address local contexts, and promote mobility of engineering services and natural persons.

Innovative Engineering Solutions and Digital Technologies and Competences are key in addressing societal challenges and problems and that partnerships are needed to build Capacity for the development of a prosperous society.



OBSERVING THAT;

Innovative Infrastructure is vital for the attainment of the SDGs and Agenda 2063 for the Africa we want and that **Engineering is key** to the actualization of sustainable infrastructure delivery and the full mobilization and input of the engineering profession at all levels will be required to deliver the goods and services needed.

CONCERNED THAT;

There are noted infrastructure development issues across the engineering such as power and renewable energy, communications, and transportation and the deficiencies outlined below:

- i) The **pool of licensed engineering practitioners** for the accelerated development of sustainable infrastructure is limited.
- ii) **There** is constrained **inter-regional skills mobility due to a limited regulation and inadequate inter-regional recognition** of educational qualifications and professional competence compounded by **retention** of engineering practitioners,
- iii) **Lack of awareness, visibility** of engineering and lack

 3 

participation of engineering practitioners in society and policy making,

- iv) **Lack of research and reliable data** on engineering, engineering skills development, and engineering education in Africa and other parts of the World.

THEREFORE;

Delegates deliberated on the key challenges, opportunities, and solutions to realize the SDGs and the Africa we want. These deliberations were focused on SDG 4, 6, 7, 9 and 13 and key resolutions were in the areas of power and renewable energy, capacity building and engineering education, policies, accreditation, and harmonization.

The delegates grouped the subthemes under the SDGS in focus and RESOLVED as follows:

1. SDG 4: "QUALITY EDUCATION"

- i. Enhancing synergy between industry and academia is crucial to align educational curricula with industry needs. Engineering and technical courses should be updated to reflect current technological trends.
- ii. Collaborative curriculum design should go beyond internships; industries should actively participate in curriculum development to ensure graduates possess the necessary practical skills.
- iii. Standardizing final-year projects and internships will help students gain hands-on experience in real-world settings, allowing them to apply academic knowledge to practical challenges.
- iv. Reskilling and upskilling initiatives should be developed to keep the existing workforce updated with new technological advancements.
- v. Providing free access to educational tools, such as simulation software, can help bridge skills gaps without financial barriers.
- vi. Technology, especially in simulation and digitalization, should be a core component of engineering education at all levels.
- vii. Encouraging project-based learning allows students to work on real-world problems, build teamwork skills, and innovate solutions, fostering partnerships with industries.
- viii. Sustainability and digital competence must be integrated into engineering education to prepare future engineers for global challenges.
- ix. Addressing the lack of diversity in engineering is essential, with initiatives aimed at attracting and retaining diverse talent.
- x. Education for sustainable development should be embedded across engineering curricula to instill core values of global citizenship and sustainability.

- xi. Education should focus on holistic and value-based approaches, incorporating ethical, leadership, and systemic thinking.
- xii. Final-year projects and assessments should reflect industry standards to ensure students have both theoretical and practical skills.
- xiii. Assessing innovation and critical thinking should be part of coursework and project-based learning to prepare students for a rapidly changing workforce.
- xiv. Strengthening public-private partnerships by encouraging industry investment in education can enhance curriculum development and real-world problem-solving opportunities.
- xv. A Kigali Declaration Engineering Education is attached as an Addendum to this resolution.

2. SDG 6: “CLEAN WATER AND SANITATION”

- i. Collaboration among governments, NGOs, engineers, and local communities is needed to address the challenges of water and sanitation comprehensively.
- ii. Embracing technological innovations, such as sequencing batch reactors (SBRs) and satellite data, can improve access to water and sanitation.
- iii. Promoting integrated water management strategies that align with environmental conservation and sustainable practices is vital.
- iv. Training communities and local governments to effectively manage water resources and sanitation systems should be a focus.
- v. Developing and funding adaptation strategies that address both water supply and demand, emphasizing climate resilience and biodiversity protection, is essential.
- vi. Consistent funding for water infrastructure and sanitation, particularly in rural and underserved areas, must be secured.

3. SDG 7: “AFFORDABLE AND CLEAN ENERGY”

- i. Strengthening regional and international cooperation is essential for securing funding for energy projects, with a focus on innovative financing solutions.
- ii. Investing in energy storage technologies is crucial for making renewable energy available during peak demand periods.
- iii. Policies should prioritize local companies in energy project implementation, considering incentives for local manufacturers and contractors.
- iv. Training engineers and energy professionals locally, in collaboration with academic institutions, will ensure effective knowledge transfer.
- v. Creating favorable environments for the local manufacturing of renewable energy products will reduce reliance on imports.
- vi. Policies must ensure long-term sustainability for energy projects, including proper maintenance and scaling of infrastructure.

4. SDG 9: “INNOVATION, INDUSTRY, AND INFRASTRUCTURE”

- i. Strengthening public-private partnerships (PPPs) enhances collaboration for sustainable infrastructure projects.
- ii. Promoting inclusive innovation is vital to address the needs of marginalized communities through stakeholder engagement.
- iii. Investing in digital tools and technologies can improve project efficiency and sustainability in the engineering sector.
- iv. Supporting local entrepreneurs and startups can stimulate economic growth, creating jobs and fostering innovation.

- v. Prioritizing infrastructure projects that incorporate green technologies can minimize environmental impacts while promoting economic growth.
- vi. Education and training programs should focus on fostering innovation and entrepreneurship in engineering fields.

5. SDG 11: "SUSTAINABLE CITIES AND COMMUNITIES"

- i. Collaboration is critical to achieving SDG 11; therefore, we emphasize the need for government institutions, international organizations, and other stakeholders to work closely with engineers in the planning and execution of infrastructure projects aimed at ensuring sustainable cities and communities.
- ii. Leveraging emerging technologies, such as big data analytics and artificial intelligence for smart urban planning, can enhance decision-making and ensure urban spaces are adaptable to future challenges, particularly climate change.
- iii. Climate resilience and green infrastructure are essential for enhancing urban resilience through climate-informed planning, adaptive designs, and green infrastructure. Incorporating climate resilience into city planning can help reduce vulnerabilities to climate stressors, such as extreme weather events, flooding, and droughts.
- iv. Inclusive urban development should prioritize the inclusion of marginalized populations, ensuring equitable access to resources and services so that no one is left behind in the creation of sustainable cities.
- v. Empowering future generations involves engaging children and youth in climate action. Future generations must be equipped with the knowledge and tools to continue fostering environmental sustainability in urban areas.
- vi. The use of sustainable and resilient materials should be prioritized by promoting durable, climate-resilient materials in construction and urban planning to minimize environmental impact and ensure long-lasting infrastructure.

6. SDG 13: CLIMATE ACTION

- i. The fight against climate change is not just a responsibility; it is an opportunity to build a sustainable future for our planet, turning ambition into action and creating a resilient world for generations to come.
- ii. Strengthening local and global cooperation and partnerships is essential, as climate change requires collaborative efforts across borders, sectors, and disciplines. Governments, the private sector, academia, and civil society should form stronger partnerships to share knowledge, resources, and technologies for climate resilience.
- iii. Investing in resilient infrastructure development, such as roads, bridges, and water management systems, is critical. Cost-effective, sustainable infrastructure can significantly improve rural access to essential services, enhance productivity, and reduce vulnerability to climate-induced disasters.
- iv. Engineering solutions should integrate environmental considerations by using sustainable materials, reducing carbon footprints, and ensuring infrastructure projects are adaptable to changing climatic conditions.
- v. Advancing and deploying technologies, such as atmospheric water generators and AI tools, can help address water scarcity, reduce emissions, and enhance climate resilience.
- vi. Governments and international organizations should prioritize funding for research and development of innovative technologies and incentivize private companies to contribute to low-carbon, climate-resilient solutions.
- vii. Sustainable land management practices, including afforestation, soil conservation, and

- sustainable agriculture, are critical in combating the effects of climate change. Such practices can reduce deforestation, prevent landslides, and improve soil fertility, thereby boosting agricultural productivity.
- viii. Establishing policies that incentivize farmers to adopt climate-smart practices and providing technical support for sustainable agriculture can mitigate the impacts of extreme weather events and ensure long-term food security.
 - ix. Strengthening disaster preparedness and resilience in vulnerable communities, especially in regions prone to disasters like landslides, floods, and droughts, is essential. Integrating climate resilience into local disaster management plans will help reduce the impact of climate-related disasters and ensure rapid recovery.
 - x. Public awareness campaigns, disaster preparedness training, and the establishment of early warning systems are vital to reducing the impact of climate-related disasters.
 - xi. Involving local communities in the design and implementation of climate resilience initiatives is crucial for long-term sustainability.
 - xii. Advocating for policy and governance reform is necessary to integrate climate change mitigation and adaptation strategies into national development plans. Setting ambitious, measurable targets for emissions reduction and enhancing climate education is essential.
 - xiii. Proper water management, including the construction of reservoirs and rainwater harvesting systems, is essential for addressing both water scarcity and floods.

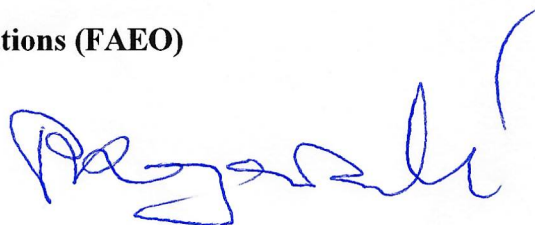
Dated this 17th of October 2024 in Kigali, Rwanda and signed and approved by the representatives of the Conference Hosts and Partners below.

(i) For the Institution of Engineers Rwanda (IER)



Eng. Gentil Kangaho:-The IER President and Chairman of Governing Council;

(ii) For the Federation of Engineering African Organizations (FAEO)



Eng. Kazawadi Papias Dedeki:- The FAEO President;

(iii) For the World Federation of Engineering Organizations (WFEO)



Engr. Mustafa Shehu:- The President