



9th UNESCO Africa Engineering Week and 7th African Engineering Conference Resolutions

PREAMBLE

The 9th African Engineering Week (AEW) and 7th African Engineering Conference was held under the theme “Celebrating & Growing Engineering Excellence in the African Region” at CSIR International Convention Centre, Tshwane (Pretoria), South Africa, from September 25 - 28, 2023. The event was a huge success with participation by representatives from Africa Union Commission (AUC), Association for the Development of Education in Africa (ADEA), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Federation of Engineering Organizations (WFEO), Federation of African Engineering Organizations (FAEO) and National Engineering Institutions from Twenty countries from Africa and other parts of the world, *namely*: Angola, Australia, Botswana, Burkina Faso, Democratic Republic of Congo, Egypt, Ethiopia, **France**, Ghana, **India**, Ivory Coast, Kenya, Liberia, Mozambique, Namibia, Nigeria, Rwanda, Somalia, South Africa, Uganda, **United Kingdom**, Zambia and Zimbabwe. The total number of participants included over 700 engineering practitioners and other delegates from Africa and other parts of the world.

There were two parallel sessions for the technical papers, and papers were selected according to different themes, namely: Power and Renewable energy; Policies, Accreditation, Harmonisation; Buildings and Places; Successful PPP Projects; ICT; Transport and Mining; Water; and Transport. The presentation format was either a panel discussion, oral presentation or posters. Various experts from ECSA, academia and industry from South Africa and Nigeria chaired sessions. All the paper topics were relevant to the conference theme and provided insights into the advancement of engineering in Africa.

A Women in Engineering Conference and Young Engineering Professionals panel session also took place. Further to this, a business to business (B2B) parallel session where consulting firms, suppliers, manufacturers, financial institutions and research entities aiming to commercialise new products in the engineering space form a crucial part of the landscape within which engineering practitioners function was held. The B2B sessions provided an opportunity for business to exchange information, collaborate, network, and learn from each other’s experiences in doing engineering business in Africa and beyond. The B2B digital platform was an effective tool that enabled participants to showcase themselves and their businesses and to connect with others who had similar goals and interests. It was agreed that B2B interactions would become a formal regular feature of the AEW conferences.

In his keynote address at the conference, attended by dignitaries from across the African continent, the Deputy President of South Africa His Excellence Paul Mashatile stated that: “Engineering is the backbone of any society and plays a role in shaping the world driving technological advancements, infrastructure development and economic progress.”

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REALISING THAT;

Engineering is the gateway to the actualisation of the African Continental Free Trade Area (**AfCFTA**) strategy and hence the need to push for favourable Regulatory Framework to groom and grow African consulting firms and contractors in implementing AfCFTA for the Africa We Want.

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. The Africa, Asia, and the Pacific (AAP) Accord by FAEO and Federation of Engineering Institutions of Asia and the Pacific (FEIAP) is an agreement that ensures professional engineering organisations in these regions that will build up capacity to align with the requirements of the International Engineering Alliance (IEA) mentoring through training and capacity building. The AAP Accord is the framework for the establishment of an International Standard of Engineering Education that empowers each member’s authority/jurisdiction or economy of FEIAP and FAEO to establish a section of the Register for Engineering for Graduate Engineers, Engineering Technologist and Engineering technicians.

OBSERVING THAT;

Infrastructure is vital for the attainment of the Sustainable Development Goals (SDGs) by 2030, Agenda 2063 for the Africa we want and that **Engineering is key** to the actualisation of sustainable infrastructure delivery and the full mobilisation and input of the engineering profession in Africa at all levels will be required to deliver the goods and services needed.

And that;

- i. This will necessitate the development of a sufficient number and quality of engineering practitioners to deliver the infrastructure we need.
- ii. **Engineering skills development** plays a critical role in ensuring that Africa has a critical mass of **engineering** practitioners to provide and design engineering solutions for the local and global market

ACKNOWLEDGING THAT;

Engineering practitioners have played a key role in the development of infrastructure in Africa **and** have contributed to the engineering profession and research community internationally. These skills can be leveraged. There has been progress reported based on endorsed **previous declarations** such as Africa Engineering Week resolutions and declarations of 2022 and the Cape Town declaration of 2022.

- i) **Engineering Education Efforts** such as the Africa Engineering Education Forum was formed by incorporating various organisations such as FAEO, AEEA, NGOs, the Research Network, Diaspora Network, and other Specialists.
- ii) **The Africa Asia Pacific accord** has been formed and has progressed in gaining momentum and support and has provided access to training sessions on outcome-based education to Africa and the Asia Pacific region.
- iii) **The Africa Diaspora and research efforts on engineering education** performed by the Africa Diaspora Network.
- iv) The project in West Africa to establish a **West African Engineering Professionals Harmonisation and Accreditation Council** (WAEPHAC) was successful.

CONCERNED THAT;

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 **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
- v) **Lack of communication mechanisms** to involve critical stakeholders.
- vi) **Several** capacity building efforts depend on volunteerism and lack **sustainable support and funding**.
- vii) The **system of the colonial era** is prevalent in the African Engineering Education landscape, and lacks cultural influence and context.

THEREFORE;

Delegates deliberated on the key challenges, opportunities, and solutions to realise the goals for Africa with the support of all organisations present. These deliberations were in the areas of power and renewable energy, capacity building and engineering education, policies, accreditation, and harmonisation. In addition to continuing work on previous resolutions, and to harmonise efforts **the delegates RESOLVED as follows:**

1 Infrastructure Development

- 1.1 To develop local solutions with international partnerships to address issues related to sustainable power and renewable energy supply.
- 1.2 To enhance the professional voice that can provide independent advice to policy makers and engineering organisations on infrastructure issues and concerns through coordinated efforts from the engineering profession locally and throughout the continent.
- 1.3 To create a mechanism to disseminate research findings, best practices and solutions deliberated in this conference to relevant bodies and associations. Formalising publications should be investigated.
- 1.4 To research the impact of technology on skills and employment especially the jobs of the future.
- 1.5 Engineering practitioners should include international technological trends and practices in their solutions, after carefully evaluating local context, sustainability, ethics, climate change, and inclusivity.

2 Engineering Capacity Development in education, policies, accreditation, and harmonisation.

- 2.1 Establish an **African Engineering Education Think Tank in partnership with ADEA** and our National Governments to facilitate the intellectual discourse and coordinate ongoing initiatives as well as new ones, in promoting home grown solutions and linkages to the global bodies and alliances in engineering education. The Think Tank should be inclusive in its membership, including representatives from government, academia, industry, private sectors, civil society organisations, development partners, **regional organisations like ADEA, the African Union, the African Diaspora, and Regional Economic Cooperation (RECs) Organisations e.g., SADC.**
- 2.2 Work collaboratively with governments and partners in putting in place actionable policies and strategies in Engineering in General and Capacity Development in Education.
- 2.3 Include a policy emphasis on experiential learning in education systems throughout the engineering development pathway. Educational programs to enhance their efforts and structures on internships, and development of early career engineering professionals (young professionals) through provision of workplace relevant training and development.
- 2.4 **Develop capacity building programmes for engineering instructors** to enhance their instructional design and approaches.
- 2.5 **Establish an ‘African Engineering Education Accord’** to facilitate interregional mobility of engineering professionals with measure of cultural competence to bring together African countries in promoting engineering education and strengthening the continent's collective voice in the global arena.
 - i) **Develop** the African Engineering Mobility Framework supported by our Governments, ADEA, RECs and the AU.
 - ii) **Develop** the Africa Accreditation Manual and other tools to accelerate the FAEO members admission to the AAP and the IEA.
 - iii) **Develop** relevant tools, such as a database of African engineering professionals - profiling who they are, areas of expertise, and create an Africa pass mechanism for engineering practitioners.

- 2.6 **Leverage existing structures and policy forums within the African Union and ADEA** to promote evidence informed policies and decision making, and the forums as platforms for peer learning and knowledge exchange for engineering education in Africa. Endorse prior resolutions within the continent on engineering education and encourage reports on actionable outcomes.
- 2.7 **Conduct research work and build engineering education capacity for research and practice.** Create access and funding mechanisms to develop capacity and conduct research. The UNESCO AEW and conference can be used as data for research work, provided that due process is followed with either the panellists, speakers, or delegates where necessary.
- 2.8 **Evaluate the effect of effect of the colonial era on current education systems** and develop culturally relevant and context-based approaches to decolonise the current educational systems.

3 Diversity, and Inclusivity (Youth and Women)

3.1 Policy Advocacy

- i) **Workplace:-** To advocate provision of adequate workplace support and establishment of strong gender equality policies and practices to women engineering professionals that will promote and ensure work-life balance, fair and transparent recruitment, promotion, and remuneration practices. To continue addressing challenges women engineering professionals face such as outdated culture notions, stereotypes, and gender-based discrimination that hinder women's participation in the engineering sector.
- ii) **Mobility: -** Advocate for policies that prioritise gender-sensitive mobility solutions, such as improved transportation infrastructure, accessibility, and safety. Engage with relevant government bodies and decision-makers.
- iii) **Engineering: -** Advocate for policies that promote gender diversity in STEM fields, including engineering. Encourage governments to adopt policies that support scholarships, mentorship programs, and initiatives specifically targeting young women.

3.2 Education, skills development, and related support

- i) **To encourage engineering professionals to continuously** engage in professional development courses that includes mastering of new technologies, learn new skills, and developing other skills that will be accomplishing their tasks efficiently and competitively.

- ii) **To encourage and establish mentorship programmes**, networking opportunities and career guidance initiatives that connect experienced engineering professionals with aspiring young talent to help bridge the knowledge and experience gaps, provide guidance, and nurture future leaders in engineering.
- iii) **To Develop training programmes and workshops** to equip young women with practical engineering skills. Partner with industry to provide internships and practical experience.
- iv) **Scholarships and Grants:** - To lobby for scholarships and grants dedicated to young women pursuing engineering degrees. These financial incentives can help reduce barriers to entry.
- v) **African countries to collaborate with governments, private organisations and NGOs** and come up with initiatives such as like **Sibo the Engineer Series** and **Artificial Intelligence Robotic Boot Camps** and clubs as well as other hands-on STEM activities that will equip skills and enable young girls to develop a passion for science, technology, engineering, and mathematics (STEM).

3.3 Advocacy, Outreach and Research

- i) **Community Outreach:** - Engage with communities to change perceptions about gender roles and STEM careers. Conduct awareness campaigns and engage parents and teachers to encourage girls' interest in engineering.
- ii) **To conduct research to understand the specific mobility challenges** faced by women across Africa and the barriers to young women entering engineering professions. Use this data to inform policy recommendations.
- iii) **International Forums:** - To present causes at international forums and conferences related to gender equality, mobility, and engineering. Collaborate with global organisations for support.
- iv) **To engage in projects and research directly related to SDGs**, contributing our expertise to sustainable development efforts.
- v) **To establish activities/programmes that continuously showcase the contributions of prominent female engineering professionals** while celebrating their accomplishments to encourage other women engineering professionals to be part of the transformative impact.

3.4 Monitoring and Evaluation and Review:

- i) Continuously monitor the impact of established initiatives and policies. To collect data on the number of young women entering engineering programs and their success rates.

- ii) Policy Implementation Oversight: - To ensure that policies related to mobility and engineering are effectively implemented. Advocate for accountability in policy execution.

Dated this 28th Day of September 2023 in Tshwane, South Africa and signed and approved by the representatives of the Conference, Hosts and Partners below.

Host Country (South Africa)

Eng. Refilwe Buthelezi: The President of
Engineering Council of South Africa



9th AEW and 7th Africa Engineering Conference

Eng. Martin Manuhwa: Chairman Chair
FAEO/WFEO Engineering Capacity Building
Committee.

The Federation of African Engineering

Organizations (FAEO) Eng Papias Kazawadi:
The President

UNESCO, Regional Office for Southern

Africa UNESCO Regional Director: Professor
Martiale Zebaze-Kana

World Federation of Engineering

Organizations (WFEO)

Engr. Mustafa Shehu: The President
