

CONCEPT NOTE

1st SADC High-level Regional Conference of Vice Chancellors and Deans of Education, Science Engineering and Technology

**Transforming SADC through quality higher
education, science, technology and innovation
towards realization of the SADC Industrialization
Strategy 2063**

Elephant Hills Hotel, Victoria Falls, Zimbabwe

20-21 February 2019



BACKGROUND

It is a global fact that investment in quality higher education and training, science technology and innovation propels industrialisation, modernisation and sustainable socio-economic development; and knowledge acquisition necessary for foresight planning and mitigation against global challenges such as climate change, associated food, water, energy insecurity and diseases. The role of universities in the generation of knowledge for driving the socio-economic transformation and modernisation of Africa and in particular Southern African Development Community (SADC), is more urgent now than ever before. The new global Sustainable Development Goals (SDGs) and African Union Agenda 2063 present SADC countries with new opportunities to accelerate the development of human and institutional capacities in higher education, research and training in Science, Technology, Engineering and Mathematics (STEM) to take advantage of these new aspirations. The 17 development goals of the SDGs couched on People, Planet and Peace calls for a building productive capacity in addressing challenges of poverty, inequality, unsustainable production, environmental degradation, climate change and security. These are also key features of the 'Common African Position (CAP) on the post-2015 development agenda and the SADC Industrialisation Strategy 2020. SADC Ministers responsible for Education and Training and Science Technology and Innovation at their joint meeting in June, 2018 in Durban, South Africa reiterated their support for investments in quality higher education, new scientific knowledge, creativity and innovation which are crucial to achieving robust economy in which different learners are thoroughly equipped to compete on the global market. The SDGs, in particular Goal 4 seeks to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all and to ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university education by 2030.

Notwithstanding, higher education in SADC countries is faced with challenges of access, quality, relevance and management and governance, which impair competitiveness of graduates on the global market. Thus, the implementation of the Addis Convention which seeks to provide an enabling environment across Africa for the recognition of higher education qualifications such as certificates, diplomas, degrees and other academic qualifications thereby allowing for the mobility of learners, academics and workers across the continent is imperative. The Addis Convention also, encourages the sharing of resources and establishment of Centres of Excellence in the region that can enhance abilities of scholars and their students to produce quality research and collaborative teaching and learning programmes.

Realising the need to strengthen human and institutional capacity the African Union's Science, Technology, Innovation Strategy for Africa (STISA) 2024, and Education and Training Strategy 2016 calls for revitalizing its higher education systems towards Science, Technology, Engineering and Mathematics (STEM) education which is key driving force for implementation of the Seven (7) Africa Aspirations 2023. And many African governments have affirmed their support for revitalising and refocusing higher education to produce innovative graduates in STEM fields since they produce and manage the knowledge that will give relevance to other institutions: governance, trade, defence, agriculture, health, finance, energy and diplomacy. Nonetheless, the SADC region has huge skills gaps in science and

engineering to drive national development aspirations and the SADC Industrialisation agenda. For example, the recent National Critical Skills Audit, 2018 by the Ministry of Higher Education Science and Technology Development, Zimbabwe indicated a total -94% deficit in Natural and Applied Sciences, -97% in Engineering, -95% in Medical and Health Sciences and -18% in Applied Arts and Humanities and compared to 21% surplus in Commerce and Business Cluster skills (of which Business Administration is oversubscribed by 320%). The imbalances in skills such as high proficiency in science and engineering, ICT, advanced electronics design and manufacturing, renewable energy, agriculture, pharmaceuticals and medicine, which are basic requisites for socioeconomic transformation, will certainly delay the aspirations of many SADC countries in harnessing the region's massive human and natural resources for the future we want.

There is urgent need to bridge the skills gap through quality higher education in which educational and skills training institutions and industries work together to produce the requisite and future knowledge-based economies which can propel SADC's competitiveness on the global markets. Investment in STEM and TVET skills are central to continuous growth, competitiveness and economic transformation which require sustained investments in new technologies and innovation in areas such as engineering, agriculture, clean energy, education and health.

It is against this background, that the UNESCO in partnership with the Government of Zimbabwe through its Ministry of Higher Education Science and Technology Development and SADC seeks to bring together Policy makers, Vice Chancellors and Deans of Education, Science Engineering and Technology Institutions, Development Partners, Private Sector Practitioners, Identified Youth Groups, SADC Secretariat and Development Partners to deliberate on the following:

What policies strategies are required to address the huge critical skills gap which are imperative for national development and regional industrialisation?

How can higher education institutions champion these implementation strategies with partners and what measure are needed to monitor the quality and effectiveness of various education and training programmes in responding to national and regional aspirations;

What joint actions and partnerships are necessary to accelerate higher education and STEM and Innovation for socioeconomic transformation and industrialisation of SADC?

This 1st SADC High-level Regional Conference of Vice Chancellors and Deans of Higher education seeks to provide the platform for policy makers, university leaders, academics, educators, researchers and private sector practitioners for exchange of ideas to address these questions among others and to forge strategic partnerships and synergies for joint collaboration, and to develop concrete action plan and framework for socio-economic transformation to accelerate the achievement of the SADC Industrialisation strategy and enhance global competitiveness.

JUSTIFICATION FOR THE CONFERENCE

United Nations Educational, Scientific and Cultural Organisation (UNESCO) Regional Office for Southern Africa (ROSA) in responding to SADC's aspirations, supported Member States in Southern Africa between 2016 and 2017, to move towards the ratification of the Addis Convention as a necessary condition for its effective implementation. Furthermore, in November 2016, UNESCO-ROSA and SADC co-hosted a Regional on capacity building training in *Data for Development in Science, Technology and Innovation (STI) and STI Policy implementation for sustainable development* in Johannesburg, South Africa in response to SADC Ministers of Education and Science Technology to build a critical mass of experts in this regard. One of the key recommendations on the roadmap was to provide a framework for developing national and regional systems of innovation, which will play a key role to drive robust and market-oriented STEM higher education for socio-economic transformation and sustainable development. As a follow-up to this regional effort, in June 2017, a High-level meeting on *Addis Convention and the role of STEM Higher Education to achieve sustainable development* took place in Gaborone, Botswana. One of the key recommendations was that investment in financial and human resources across all levels of education is needed to strengthen STEM Programmes.

It within this context of national and regional Ministerial requests that UNESCO and partners are organising the 1st SADC High-level Regional Conference Regional Conference of Vice Chancellors and Deans of Science Engineering and Technology to develop a framework for accelerating higher education and STI as drivers for SADC Industrialisation.

The conference seeks to strengthen synergy of higher education and research institutions to respond to the SADC's aspirations through mobilising STEM for sustainable socio-economic transformation of the region. It is recognized that higher education system must maintain a high level of responsiveness to the demands of the market for it to be relevant to the demands of the economy of SADC countries. The conference is a sequel to a recent Higher Education and STEM conferences and workshops. The main the development objective objectives is to develop a framework for higher education to provide modalities, implementation strategy and recommendations (policy, academia and industry) for addressing huge critical skills gaps in STEM and TVET which are imperatives for the 4th industrial revolution and future jobs and in robotics, artificial intelligence, ICT and innovation.

AIMS AND OBJECTIVES

The aim of this 1st SADC conference is to provide a forum for university leaders, policy makers, academics, development partners, international scientific and engineering networks and private sector to deliberate on why, what and how to revitalise higher education science, technology, engineering and mathematics training research and innovation towards achieving sustainable development goals in Southern Africa and beyond. It is also provide the forum to engage the stakeholders in the field of higher education to deliberate on key issues on sustainable and inclusive quality higher education in the region and to sensitize them on the implementation of the provisions of the 2014 Addis Convention on higher education. This will be conducted under the following strategic intent:

Transforming SADC through Robust STEM Higher Education Training Innovation

It is through a vigorous STEM Education that Southern Africa can participate in creating scientific research and technological tools to solve the daunting catalogue of internal and trans-border health, energy, development, water access and quality-of-life challenges confronting our globalized society; and in the process, provide its citizens with the capabilities to develop economically productive and independent middle classes as vanguards of economic progress and democratic stability.

The conference will also create a platform for ANSTI member-institutions within Southern Africa, which are focused on improving STEM higher education, to deliberate and identify areas of synergies that can be leveraged upon to advance SADC's Industrialisation Strategy. During the conference, there will be a series of presentations and interactive roundtables on innovative practices in support of the key elements for Systemic Change in Undergraduate STEM Teaching and Learning: pedagogy, scaffolding, and cultural change. There will be numerous opportunities to engage in dialogue on the common themes Southern African Universities confront when transforming STEM education and output. The conference will also provide a unique platform for the strengthening networks between academia, science and engineering societies and industry experts with the main aim of ensuring that universities, and institutions produce graduates and research that correlates with current and future requirements of industry.

This conference, will serve as a platform to advise the STI experts, on the recommendations, needs, requirements, and concerns raised by the policy makers from various high level ministerial workshops on science, technology and innovation as well as higher education. Conversely, recommendations and outcomes of this conference will be communicated at the upcoming 4th Science Forum South Africa, to raise awareness on issues raised to various stakeholders and to prompt action. It will also provide opportunity for the key actors in the implementation of higher education to discuss how to encourage and promote the most effective use of human resources available in Africa, speed up the development of countries and to limit the African brain-drain; facilitate the exchange and greater mobility of students, teachers and researchers of the continent; possibilities for setting up high-level joint training and research programmes, and explore innovative ways to improve and reinforce the collection and exchange of information among others in line with the provisions of the Addis Convention.

Subthemes:

- 1. Strengthening higher education policies to accelerate critical skills development:** role of policy makers and development partners in setting robust higher education policy systems and governance strategies to enhance higher education teaching and learning, training, research and innovation; student and staff mobility; develop critical mass. How can African countries grab opportunities in the world Higher Education Institutions (HEIs) and trends?
- 2. The roles of higher education institutions to achieve the new development agenda (Agenda 2030, African Union Agenda 2063, STISA 2024)**

Reviewing the role of higher education institutions as a key stakeholder in the delivery of quality, inclusive and relevant higher education and training in the fields of science and technology; Increasing the participation of women in science and technology employment; STEM Education Achievements, Challenges and Prospects for Sustainable Development in Africa: Case studies; Mobilizing Resources for STEM Education in Africa; With STEM in HEIs Africa can produce the required human capital with skills to modernize its economy; the internationalization in higher education the region and implications for the mobility of staff and students; and the role higher education in the ratification and implementation of the Addis Convention.

3. Establishing and strengthening linkages and partnerships for research and training:

Revitalizing cooperation among African Universities in the face of limited resources to ensure quality and relevance of higher education in critical skills development. How can African universities work together to ensure better cooperation in sharing knowledge and expertise of existing faculty members to boost the quality of skilled human resources produced and internationalization of higher education? In the context of the revised Convention on the Recognition of Studies, Certificates, Diplomas, Degrees and Other Academic Qualifications in Higher Education in African States known as the Addis Convention, how can African universities play a stronger role in revitalizing the provision of higher education in Africa? How could this strengthen and promote inter-regional and international cooperation in the field of recognition of qualifications?

EXPECTED OUTCOMES

- Platform created for university leaders, policy makers, academics, development partners, international scientific and engineering networks and private sector to deliberate on mechanisms to revitalise higher education science, technology, engineering and mathematics training and research and innovation.
- Innovative science, technology, engineering and mathematics training policies and programmes identified and discussed for Africa's industrial, social and economic resurgence
- Policies and strategies for engaging governments, Quality Assurance bodies, HEIs and other stakeholders identified for enhancing quality and relevance of higher education.
- Learning alliances and partnerships for higher education research and training in STEM education within and between countries created
- Concrete plan of action in policy issues, and HEIs governance issues and the benefits for implementing the 2014 Addis Convention on Higher Education

MODALITY OF ACTION

The conference will include keynote presentations, plenary sessions, presentation of lead papers and round table discussions.

PARTICIPATION

Target participants comprise of Ministers of Science and Technology, Ministers of Education, Vice Chancellors and Deans of Science and Engineering Institutions, African Academy of Sciences, Development Partners, Development Banks, Policy Makers, The African Union Commission of Science (AUC), Department for Human Resources, Science and Technology (HRST), Southern African Regional Universities Association (SARUA), ADEA Working Group on Higher Education, International Council for Science (ICSU), University professionals, Experts, International Networks of Science and Engineering and individuals from all over Africa and the globe are invited.

INTERNATIONAL PARTNERS AND PARTICIPATING INSTITUTIONS

African Union, Association of African Universities, The World Bank, African Development Bank, The African Capacity Building Foundation, NEPAD, SADC, SIDA, DFiD, USAID, National and Regional Academies of Science and Engineering, international affiliated universities, the Governments of the United Kingdom, United States of America, Australia, China, Korea, India Malaysia and others.

CONFERENCE VENUE

The venue of the meeting is the Elephant Hills Hotel situated at the Victoria Falls, a UNESCO Heritage Site in Zimbabwe.

LOCAL ORGANISING COMMITTEE

Ministry of Higher and Tertiary Education, Science and Technology Development; UNESCO Regional Office for Southern Africa, Bindura University of Science Education, Harare Institute of Technology, Chinhoyi University of Technology, National University of Science and Technology, University of Zimbabwe.

Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD), Government of the Republic of Zimbabwe

The Ministry of Higher and Tertiary Education, Science and Technology Development is a government ministry focused on higher and tertiary education in Zimbabwe and is responsible for universities, polytechnics and colleges in Zimbabwe. The MHTESTD's mission is to provide an effective system for the production of patriotic and competent high level manpower through the provision and accreditation of higher and tertiary education programmes and

institutions for sustainability and global competitiveness. The ministry has recently embarked on a number of initiatives to promote STEM education in the country. It is also a key player in the process of ratification of the Addis Convention on Higher Education in Zimbabwe.

UNESCO

UNESCO is the UN agency mandated with policy support and capacity building in higher education, including science, technology, mathematics and engineering education, natural science policy, social and human science, ICT and culture, communication and information policies. The Organization works to build the scientific knowledge base through higher education to help countries manage their human and natural resources in a sustainable way through flagship projects in over 20 affiliated research centres around the world and through a series of science and engineering related UNESCO Chairs. UNESCO and its partners including (Category I and II institutions) offer strong technical expertise in higher education and its link with education for sustainable development, climate resilience, while also having the power to convene a wide range of stakeholders for the conference.

Bindura University of Science Education

Bindura University of Science Education (BUSE) is a leading University advancing STEM Education through implementing various strategies to attract and encourage students to pursue degrees in STEM disciplines for socio-economic development. The university offers internationally accredited STEM programmes at both Undergraduate and Postgraduate level, Science Teacher Education, International and National STEM Conferences and Workshops, Annual Science and Mathematics Olympiads, University STEM Scholarships, partnerships with STEM Stakeholders, outreach programmes, specific recruitment strategies and STEM education research, BUSE has strived to advance STEM Education in Zimbabwe. STEM education is the core of Bindura University of Science Education as it prides in promoting Science for human development. Bindura University of Science Education is the Chair for the Association of Universities in Zimbabwe.

University of Zimbabwe

The University of Zimbabwe (UZ) is the oldest and formerly largest university in Zimbabwe. It was founded through a special relationship with the University of London and it opened its doors to its first students in 1952. The university has ten faculties (Agriculture, Arts, Commerce, Education, Engineering, Law, Science, Social Studies, Veterinary Sciences and College of Health Sciences) offering a wide variety of degree programmes and many specialist research centres and institutes. The university is accredited through the National Council for Higher Education, under the Ministry of Higher and Tertiary Education. The University has 10 faculties and a College of Health Sciences.

Harare Institute of Technology

The Harare Institute of Technology (HIT) was granted degree awarding status in 2005 with the promulgation of the Harare Institute of Technology Act {Chapter 25:26}. Harare Institute of Technology is the hub of technology development and delivery of technology programmes at undergraduate and postgraduate level. Programs offered are Bachelor of Technology (B. Tech)

Honours Degrees which include: B. Tech Hons Computer Science B. Tech Hons Software Engineering Bachelor of Pharmacy Honours (B. Pharm) B. Tech Hons E-Commerce B. Tech Hons Financial Engineering; B. Tech Hons Chemical Process Systems Engineering; B. Tech Hons Industrial and Manufacturing Engineering; B. Tech Hons Electronic Engineering; B. Tech Hons Biotechnology; B. Tech Hons Food Processing Technology B. Tech Hons Information Technology; B. Tech Hons Information Security and Assurance The University has the second School of Pharmacy after University of Zimbabwe.

Chinhoyi University of Technology

Chinhoyi University of Technology (CUT) was established as part of the recommendations of the Chetsanga Commission to devolve Chinhoyi Technical Teachers' College and other similar colleges into degree - awarding institutions following the realization that technology is the key driver and central cog to industrial development and economic prosperity in Zimbabwe. CUT was established by an Act by the Parliament of Zimbabwe on 10 December 2001. Today, the university provides undergraduate and postgraduate courses in its schools of Agricultural Science and Technology, Natural Science and Mathematics, Engineering Science and Technology among 5 other schools. CUT vision is to be the world-class centre of excellence for technological innovation and entrepreneurship. Its mission is to produce innovative graduates, create knowledge, enhance entrepreneurship and provide community service through quality teaching, training and technologically oriented research

National University of Science and Technology

The National University of Science and Technology (NUST) is the second largest public research university in Zimbabwe, located in Bulawayo. It was established in 1991. NUST has 7 faculties. Each faculty consists of a number of related departments, each offering a degree program. The faculty of Industrial Technology offers Bachelor of Engineering Honours degrees in the following programs: Electronic Engineering, Chemical Engineering, Industrial and Manufacturing Engineering, Civil and Water Engineering, Fibre and Polymer Materials Engineering. The Faculty of Applied Sciences offers Four Year Bachelor of Science Honours Degrees in the following programmes: Applied Chemistry, Applied Mathematics, Applied Physics, Computer Science, Informatics, Environmental Science and Health, Forest Resources and Wildlife, Statistics and Operations Research, Radiography, Sport Science and Coaching. NUST vision is to be an International Centre of Excellence in Science and Technology, and Entrepreneurship for Sustainable Development By 2025. Its mission is To Spearhead Human Capital Development for Industrial and Socio-Economic Transformation through Science and Technology Based Solutions.

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