



**National Commission for Science, Technology and Innovation**

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**THE 1<sup>ST</sup> MULTISECTORAL CONFERENCE ON  
SCIENCE, TECHNOLOGY AND INNOVATION (STI)**

*Theme:*

**STI GOVERNANCE AND MAINSTREAMING: INFUSION IN  
NATIONAL DEVELOPMENT AGENDA IN A DISRUPTED WORLD**

**COMMUNIQUE: RESOLUTIONS OF PARTICIPANTS**

**6<sup>TH</sup> AUGUST 2021**



# MULTI-SECTORAL CONFERENCE ON STI

THEME

## “STI Governance and Mainstreaming: Infusion in National Development Agenda in a Disrupted World”

### CHIEF GUESTS



**Prof. George A. O. Magoha, EGH**  
Cabinet Secretary  
Ministry of Education



**Dr. Narendra Raval**  
The Chancellor, Egerton  
University, and Industrialist

### CONVENER CO-CONVENER



**Prof. Walter O. Oyawa**  
Director General,  
NACOSTI



**Dr. Jemimah Onsare**  
Ag. Chief Executive  
Officer, NRF

### DATES

From **4th August 2021**

To **6th August 2021**

Pre-Conference Meetings on 3rd August 2021

PARTNERS



### KEYNOTE SPEAKERS



**Amb. Simon Nabukwesi**  
PS, SDUER  
Ministry of Education



**Prof. Fatuma Chege**  
PS, Implementation of Curriculum  
Reforms, Ministry of Education



**H.E Martin Nyaga Wambora, EGH**  
Chairperson, Council of Governors  
and Governor, Embu



**Josephine Gauld**  
Deputy High Commissioner and  
Permanent Representative to UNEP &  
UN Habitat, British High Commission



**Dr. Danica Ramljak**  
Senior Science and  
Innovation Expert for The  
World Bank



**Flora Mutahi**  
Chairperson, KEPSA  
(TBC)



**Prof. Geoffrey M. Muluvi**  
VC, SEKU and Chairperson,  
Vice Chancellors Committee  
(Public)



**Halakhe D. Waqo**  
Chairperson, Universities  
Fund



**Prof. Reuben Marwanga**  
Chairperson, KENIA



**Prof. Tom Migun Ogada**  
CEO, ACTS



**Eng. Wangai Ndirangú**  
Chairperson, KeNHA



**Eng. Erastus Mwangera**  
Chairperson, Engineers  
Board, Kenya



**Prof. Ahmed Ferej**  
Chairperson, TVETA



**QS. David Galtho**  
Chairperson, National  
Construction Authority

### HIGH LEVEL PANEL ON STI



**Prof. Olive Mugenda**  
Chairperson, KUTRRH and  
Former VC, Kenyatta University



**Prof. Crispus Kiamba**  
Chairperson ATPS and Former PS,  
Former VC, UoN



**Prof. Raphael Munavu**  
Chairperson KNAS and Former  
VC, Moi University



**Prof. Ratemo Michieka**  
Chairperson ASRIC and Former  
VC, JKUAT



**Prof. Mabel Imbuga**  
Chairperson NACADA and Former  
VC, JKUAT



**Prof. Shaukat A. Abdulrazak**  
Director, Division for Africa,  
Technical Cooperation  
Department, IAEA and Former  
CEO, NACOSTI



**Prof. Henry Thairu**  
Chairperson, Daystar University  
and Former Chairman, CUE



**Prof. David Some**  
Former VC, Moi University,  
Former CEO, CUE, and Former  
Chairman, TAHEST

## 1. PREAMBLE

### 1.1 Overview

The National Commission for Science, Technology and Innovation (NACOSTI) together with partners hosted a three-day virtual Multisectoral Conference from 4<sup>th</sup> to 6<sup>th</sup> August 2021. The Conference was coordinated from Lake Naivasha Resort. The Conference focused on six thematic areas on Science, Technology and Innovation (STI). These are as follows: STI Governance and Regulatory Framework; STI Priorities, Development and Diffusion; STI Mainstreaming and Infusion; STI Education, Training and Advocacy; STI Funding and Investments; and STI and Industrial Transformation. The Conference was dedicated on the following topics:

- The Regulatory and Institutional framework governing the STI sector
- STI Indicators, and impacts on Kenya's Global Competitiveness in technology innovation
- Impacts of STI on national development in a disrupted world
- Priorities in scientific, technological and innovation activities in Kenya
- STI Funding and Investments
- Technology Commercialization/Extension
- STI as the vanguard in the delivery of the Big Four Agenda
- STI Education, Training, Communication, and Advocacy
- Deep Dive Reforms in Higher Education Institutions in a Disrupted World
- Mainstreaming/Infusion of STI in Institutional Programmes and Projects
- Intellectual Property Rights, and Global Innovation Index
- Harnessing Frontier Technologies in response to Emerging Issues
- Technology driven urban, and county development
- SMART Cities, Industrial/Technology Parks, and fifth (5<sup>th</sup>) Industrial Revolution
- Global and Regional Partnerships in fast-tracking Technology Diffusion and Adaptation
- STI-based international obligations and treaties

The Conference was conducted through a series of keynote speakers, panel discussions and plenary sessions on the above topics of national interest, and displays of impacting technologies, innovations and research outcomes.

## 1.2 Aim of the Conference

Faced with the unprecedented social and economic disruption caused by COVID-19 pandemic, countries, institutions as well as individuals have quickly developed and adopted technological innovations, tools and systems to save lives, maintain social fabric, prevent the spread of the disease and facilitate the functioning of businesses, jobs and education. The pandemic has presented an unfettered prospect for countries and institutions to increase investments in science, technology and innovation (STI) and its enabling R&D for national security, public safety, social order, and wellness of the society, thus elevating STI as a first responder to mankind's survival subject to providence. It is in this context and premise that the National Commission for Science, Technology, and Innovation (NACOSTI) organized the 1st Multisectoral STI Conference, in collaboration with the National Research Fund (NRF) and other partners.

The 1<sup>st</sup> Multi-sectoral Conference on "STI Governance and Mainstreaming: Infusion in the Country's Development Agenda in a disrupted world" aims to bring together leading industrialists, captains/champions of the industry, STI institutions and MDAs, private sector, innovators, professionals, leaders, scholars, intellectuals, scientists, and researchers to exchange and share their experiences, STI achievements and developments, R&D results, and networks on all aspects of Science, Technology and Innovation (STI). It also provides a premier multidisciplinary, interdisciplinary, and intradisciplinary platform for professionals, practitioners, inventors, innovators, entrepreneurs, scholars, researchers and educators to present and discuss the most recent innovations, scientific and technological advancements, and STI trends and trajectories, in a world disrupted by the pandemic.

## 1.3 Participants

Over four hundred (400) participants attended the Conference. The participants were drawn from the following national and international institutions/organizations, viz, Universities, University Colleges, Research Institutions, TVET Institutions, the private sector, the British High Commission in Kenya, The United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank, National Commission for Science, Technology & Innovation (NACOSTI), National Research Fund (NRF), Kenya National Innovation Agency (KENIA), Konza Technopolis Development Authority (KoTDA), National Authority for the Campaign Against Alcohol and Drug Abuse (NACADA), Universities Funding Board (UFB), African Centre for Technology Studies (ACTS), Kenya National Highway Authority (KENHA), Engineers Board of Kenya (EBK), National Construction Authority (NCA), Kenyatta University Teaching, Referral and Research Hospital (KUTRRH), African Technology Policy Studies Network (ATPS), Kenya National Academy of Sciences (KNAS), African Scientific, Research and Innovation Council (ASRIC), International Atomic Energy Agency (IAEA), among others.

## 2. CONFERENCE OBSERVATIONS AND RESOLUTIONS

Participants of the 1<sup>st</sup> Multisectoral Conference on STI held as from 4<sup>th</sup> to 6<sup>th</sup> August, 2021 committed and made observations and resolutions as below.

### 2.1 Institutionalization of the Multisectoral Conference

The multisectoral conference provided a unique forum for stakeholders to engage on the current status of science, technology and innovation in the country and its infusion in the Country's Development Agenda for inclusive and sustainable growth. In order to strengthen collaborations and partnerships among institutions in the STI ecosystem it is **resolved** as follows:

- (i) Taking cognizance of NACOSTI's role as a cross-cutting and multi-sectoral regulator on matters Research, Science, Technology and Innovation, NACOSTI to institutionalise a Multisectoral STI Conference and exhibitions to be held on an annual basis that brings together the diverse stakeholders; and
- (ii) Key stakeholders including Universities, University Colleges, Research Institutions, TVET Institutions, relevant regulatory agencies, STI-based institutions, and the private sector to support and participate in upcoming Multisectoral STI Conferences and exhibitions. In this regard, a leading industrialist and Chancellor of Egerton University, Dr. Narendra Raval who in his capacity as the Chief Guest on the last day of the Conference and hence gave a Keynote Presentation, committed himself that the next Multisectoral STI conference be held at Egerton University, if NACOSTI will allow, and all the industrialists will be invited and requested to commit support for the STI Sector starting with himself with the ultimate aim of deploying STI to change the lives of Kenyans for the better. He guided that the multisectoral conference on STI be organized on an annual basis.

### 2.2 Response to COVID-19 Pandemic

COVID-19 Pandemic presents immense risks to the economy and to key dimensions of national institutions. Advances in science, technology and innovation hold a key to mitigating against the widespread effects of the COVID-19 pandemic and other future emergencies. Accordingly, it is **resolved** that;

- (i) There is urgent need for more investments in science, technology and innovation to enable the country secure national security and public safety;

- (ii) Institutions and stakeholders in the STI Sector including Universities, University Colleges, Research Institutions, TVET Institutions, STI-based regulatory institutions, STI-based Ministries, Departments and Agencies, and the Private Sector should make deliberate efforts by investing in R&D; and
- (iii) The industry should initiate, develop and market innovations that will provide solutions to mitigate the adverse effects of COVID-19 on the Kenyan populace.

### 2.3 Funding of Research, Science, Technology and Innovation

The STI Act 2013 (Rev. 2014) under section 32(2)(a) provides for a sum of money amounting to two per cent of the country's GDP to be provided by the Treasury every financial year. According to the STI Act the object of the Fund shall be to facilitate research for the advancement of science, technology and innovation. Research and Development (R&D) activities allow scientists and researchers to develop new knowledge, technologies and innovations that spur economic growth. It was noted that the current level of funding for R&D was about 0.8 per cent. Taking cognizance of the fact that research is an investment, it was **resolved** that:

- (i) The three-funding bodies provided for under the various Acts, namely the National Research Fund under the STI Act, the Universities Funding Board under the Universities Act, and the TVET Funding Board under the TVET Act be strengthened to ensure adequate resources for the sector.
- (ii) The operational documents establishing the three funds should be reviewed by the relevant Government Agencies.
- (iii) The Government be urged to fully implement Differentiated Unit Cost (DUC) in funding programmes at the university level.
- (iv) It was strongly urged that the Government and private sector investors should invest 2% of GDP in research, science, technology and innovation, subdivided among the three key thrusts of the STI Sector, namely, Universities, Research Institutions, and TVET Institutions. The use or allocation of the 2% of GDP investment on national priority projects be guided by the corresponding regulatory bodies. The meeting emphasized that the 2% of GDP is an investment that is likely to manifest seven-fold into the lives of Kenyans.

- (v) NACOSTI and NRF should engage key institutions including the National Treasury and Parliament with a view to increasing the funding for STI. In this regard, there is need to develop capacity among scientists/researchers/STI leaders for advocacy and lobbying.
- (vi) The Government should incentivise private sector for example through tax exemptions to financially support research. In this regard, NACOSTI to develop a framework that attracts industry to collaborate on matters Research, Science, Technology and Innovation
- (vii) Innovative financing mechanisms be enhanced by bringing on-board venture and angel capital and other players in the financial sector
- (viii) NACOSTI to advocate for tax-free Research Equipment to facilitate the national research agenda, and effective sharing of equipment realized through collaborations
- (ix) The STI Sector makes optimal utilization of the available limited resources in accomplishing the deliverables for the STI goals.
- (x) NACOSTI to document and disseminate available R&D Infrastructure/Equipment in various institutions so as to encourage optimal use of available R&D Infrastructure/Equipment, and minimize unnecessary duplication of the same.

#### **2.4 Research Chair Programmes, and Centres of Excellence**

Taking note of ongoing implementation of the National Research priorities framework that is anchored on Research Consortia approach, Institutions in the STI Sector, Counties, and the Private sector are encouraged to support the establishment of Research Chair Programmes, and Centres of Excellence to fast-track the realization of the Big Four Agenda. In this regard, a leading industrialist and Chancellor of Egerton University, Dr. N. Raval committed that he will consult his colleagues in the industry if they can assist in the formation of the industry-based research chair programme geared towards benefiting the STI sector including Universities and Research Institutions. The research chair programmes will be competitive and coordinated by NACOSTI.

## 2.5 Promote and encourage Private Sector involvement in STI development

Private sector involvement in STI is relatively low hence resulting in low creation/development and uptake of technologies. In view of this it is **resolved** that:

- (i) The role of the private sector should be encouraged in the spirit of public and private participation. In this regard, a leading industrialist and Chancellor of Egerton University, Dr. N. Raval has pronounced that he is willing to be the lead person for the facilitation of the direct linkage between the industry, academia, and government in collaboration with NACOSTI and the Ministry of Education. He requested that the resolutions that emerge from the STI multisectoral conference be sent to him so that he can share the same with his private-sector colleagues.
- (ii) NACOSTI in consultation with stakeholders formulate and implement an STI Sector - Private Sector Strategy and implementation Framework.
- (iii) NACOSTI and partners to lobby government to introduce appropriate tax incentives and/or tax relief aimed at encouraging R&D activities by the private sector.

## 2.6 Collaboration and Partnerships

It is recognized globally that collaborations and partnerships have become a very important mechanism of business interaction, and market and technology access. The country could benefit immensely if there was synergy among the existing STI institutions. Further, there is need to develop and strengthen strategic partnerships with STI institutions and organizations at international level. NACOSTI is a focal point of various international organizations and institutions implementing treaties and conventions including: The Biological Weapons Convention (BWC) that outlaws biological arms; International Centre for Genetic Engineering and Biotechnology (ICGEB); the African Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA); and The Comprehensive Nuclear-Test-Ban Treaty (CTBT). Accordingly, it is **resolved** that:

- (i) NACOSTI to undertake more engagements with other agencies in the STI ecosystem including public universities and the Commission for University Education (CUE) in the areas of research and development.



- (ii) There is need to strengthen the role of universities, TVETs and research institutions in fostering integration and infusion of STI in economic activities.
- (iii) There is need to promote country, regional and international collaborations and partnerships between the public and private sectors in existing and emerging STI areas. In this regard, institutions should take advantage of existing opportunities available in Kenya's International treaties and obligations.
- (iv) There is need to enhance institutional, national, regional and international collaborations and partnerships to increase investments in STI. The collaborations should evolve innovations that improve the lives of Kenyans, and minimize importation of products that can be made in Kenya.

## **2.7 Recognition of Scientists/Researchers and Champions of STI**

Kenya boasts of outstanding scientists, scholars and researchers some of whom have been recognized globally for their various contribution in their field of expertise. There is need to recognise and award some of the renowned scientists, scholars and researchers who have contributed their services with a passion, dedication and commitment for the development and competitiveness of the country, and mankind at large. Accordingly, it is **resolved** that:

- (i) NACOSTI to develop a framework for identification/assessment and recognition of STI contributions by Kenyan scientists.
- (ii) There is need to develop a framework for recognition of Professor Emeritus within the universities given the wealth of knowledge and expertise that they have

## **2.8 Strengthen Mechanisms of Performance Management for the STI Sector**

Taking note of NACOSTI's cross-cutting and Multi-sectoral regulatory framework and authority, it is **resolved** that NACOSTI :

- (i) Should prioritize and develop, in consultation with other stakeholders, the priorities in scientific, technological and innovation activities in Kenya in relation to the economic and social policies of the Government, and the country's international commitments.
- (ii) Together with partners, should institute measures to ensure the comprehensive realization of the provisions stipulated in the STI Act in tune with prevailing circumstances in a disrupted world.

- (iii) Should ensure co-ordination, co-operation and collaboration between the various STI institutions and agencies involved in science, technology and innovation.
- (iv) Should undertake an STI baseline survey, including a skills inventory for Kenyans in the country and in the diaspora, as well as status of the current STI infrastructure.

## **2.9 Strengthen the Teaching of Science, Analytics and Technology Education at all levels**

Science, Technology, Engineering and Mathematics (STEM) education equips young people with requisite skills that make them more practical, analytical, employable and ready to meet the current labor demand. STEM education should include improving STEM instruction and learning, increasing and sustaining youth and public engagement in STEM, enhancing the STEM experience of undergraduate students, providing STEM learning opportunities to groups historically underrepresented in STEM fields, designing graduate education for tomorrow's STEM workforce, and enhancing the STEM experience and value proposition through digital tutors, learning analytics, simulations, games, and embedded assessment. Unfortunately, there is relatively low participation of learners in STEM education at the higher education levels. Accordingly, it is **resolved** that:

- (i) NACOTI should strengthen its advisory role on science education and innovation at both basic and advanced levels and in light of the implementation of Competency Based Curriculum (CBC).
- (ii) NACOSTI, in partnership with the key players in STEM, should develop and implement the National Strategy for STEM Education that will ensure that all citizens have lifelong access to high quality STEM education leading to enhanced STEM literacy, innovation, and employment
- (iii) At the university level, Problem Based Learning (PBL) should be advocated and adopted as learners transit implement CBC
- (iv) Stakeholders should strengthen and align science, technology and innovation systems and industrial policies, building digital skills among students and the workforce, and closing digital divides
- (v) Education institutions should ensure STEM education and training incorporates the 21st-century soft skills of communication, collaboration, critical thinking, and creativity so as to create a tech society that is able to diffuse what is learned into society.

## 2.10 Sensitize, Review and Strengthen Research and STI Regulatory and Institutional Framework

The STI Act established the National Commission for Science, Technology and Innovation; the Kenya National Innovation Agency; and the National Research Fund as the institutional frameworks for the governance of the national research and innovation system. There are also other Acts under different ministries whose mandates involve regulation of different aspects of research. There is need to have the different Acts harmonized. Accordingly, it is **resolved** that:

- (i) NACOSTI to periodically sensitize each of the various diverse groups of key stakeholders on current provisions in the STI Act and its accompanying Legal Notices, regulations and guidelines. In this regard, stakeholders are expected to familiarize themselves with the prevailing regulatory and institutional framework for Kenya's Research Systems (viz. Research, Science, Technology and Innovation), and to promptly provide written suggestions and recommendations on draft documents pertaining to the same.
- (ii) Taking cognizance of the various regulatory instruments in various sectors of the economy, there is need to review and harmonize relevant legislation and governance structures where applicable, in consultation with each of the diverse groups of stakeholders. The Ministry of Education and NACOSTI to spearhead the activity.
- (iii) NACOSTI to periodically review its functions with a view to delegating some of them to competent agencies such as the Kenya National Academy of Sciences, while maintaining the overall oversight of the delegated functions.
- (iv) Members of the High Level Advisory Panel on STI should play a key role in the sensitization, advocacy and stakeholder engagement programmes of Kenya's Research Systems
- (v) The Ministry of Education, NACOSTI and partners should engage more with the relevant Parliamentary Committees as part of lobbying and advocacy with a view to fast-tracking the review of relevant STI legislations, where applicable, as well as seeking enhanced investment in STI.

## 2.11 Technology Transfer, Innovation and Commercialization

Technology transfer, which is the process of transmission of results of basic and applied research to the design, development, production and commercialization of new and improved products, services, or processes is relatively low in Kenya. Accordingly, agencies should promote innovation and commercialization from R&D investments, as well as advocate for uptake of Research outputs. Consequently, it is **resolved** that:

- (i) There is need for KENIA to spearhead the development of a framework for technology transfer and Commercialization in consultation with stakeholders
- (ii) There is need for institutions to establish Science and Technology Parks, Centres of excellence, Innovation hubs, and Incubation hubs and accelerators in the Universities, Research Institutions, and counties in tune with priorities in scientific, technological and innovation activities identified by NACOSTI.
- (iii) There is need to develop a framework to facilitate harnessing of traditional, local and indigenous knowledge to control diseases in humans and animals in the communities. This may be part of the National Research Priorities.
- (iv) There is need to create mechanisms of linking innovators with the market and the industries for those with prototypes. KENIA to spearhead such efforts.
- (v) There is need to collectively institute mechanisms to improve Kenya's Global Innovation Index (GII) as well as improve global ranking of research institutions/agencies so as to enhance the overall Kenya's global competitiveness based on internationally recognized STI indicators.

## **2.12 Drug and Substance Abuse**

Taking note of the extreme threat posed by substance abuse especially during the COVID-19 pandemic, NACOSTI should collaborate with NACADA and other relevant institutions on enhancing and promoting Research on Alcohol and Drug Abuse, and its impacts on Mental Health.

## **2.13 Refocussing of University Education and Training in tune with global trends**

- (i) Universities should redefine their core mandate and transform themselves into 5.0 Model that focusses on: Research, Teaching, Community service, Innovation and industrialization.
- (ii) The University-Industry-GoK-Community/Civil Society collaboration should highly and urgently be encouraged to establish high level collaborations to produce innovations and technologies through joint research and consultations to speed up their uptake for economic growth and development...
- (iii) Universities in the 21<sup>st</sup> century should transform themselves into entrepreneurial universities where the focus is on creation of spin-off companies or licensing of intellectual property assets.

## **2.14 Leadership Training for Scientists, Researchers and STI Leaders**

As part of efforts to develop world-class researchers as well as scientific, technological, and innovation leaders in the region and in the world, there is need to initiate collaborative training and mentorship programmes to enhance research, research management, grant-seeking/resource mobilization and leadership skills amongst scientists, researchers and STI Leaders. The programmes will enhance the capacity to publish, patent and lead relevant and high-quality research and innovations that have positive impact on inclusive sustainable development of the region. In this regard, NACOSTI is called upon to coordinate the development of such programmes, and to create a framework to educate, train and mentor Scientists, Researchers, and STI leaders.

## **2.15 Strengthen engagement of TVET with Micro, Small and Medium Enterprises (MSMEs)**

TVET affords practical avenue for acquiring employable skills for the world of work and preparing trainees for a specific profession by providing them with appropriate skills required by the labour market or for self-employment. It increases the chances of trainees gaining employment quickly, or setting up their own enterprises, creating a vibrant labour market and contributing to economic growth. In this regard it is **resolved** that:

- (i) There is need to strengthen engagement of TVET with Micro, Small and Medium Enterprises (MSMEs)
- (ii) There is need to increase investment in TVET to create a flourishing manufacturing and agro-processing industries in agriculture and other informal sectors.

## **2.16 Next Generation STI Workforce**


The next generation workforce will be taken up by those that will seize on opportunities provided by Frontier Technologies/Digital Technologies in capacity building on health, agriculture, housing, manufacturing, and environmental issues at community level. Accordingly, training and mentoring a technology-savvy workforce will require a collaborative effort between training institutions and the industry aimed at exposing the next generation STI workforce on underlying principles of technology development as well as ethical implications

of frontier technologies such as artificial intelligence, quantum computing, 5G, machine learning and cybersecurity. It is thus **resolved** that:

- (i) Priority should be given to investments in STI capacity building and technology development/adaptation that address the challenges of, and tap into the opportunities afforded by Frontier Technologies such as the Big Data revolution, artificial intelligence (AI), Blockchain, Robotics, Internet of Things (IoT), Cloud computing, Synthetic Biology, Nano, 3-D printing, Digital Systems, Cybersecurity and Biosecurity.
- (ii) Universities and Research Institutions should seek deliberate funding or investments to develop and support interdisciplinary programs that facilitate faculty, researchers, trainees, and students to apply their technical knowledge to real-world problems. This may form part of Problem Based Learning (PBL) under the Competency Based Curriculum (CBC) approach.
- (iii) There should be more deliberate investments in advanced communications, networking, and broadband access to ensure that citizens can continue to work and access education and medical services remotely.
- (iv) NACOSTI to promote and spearhead Kenya's uptake and adaptation of Frontier Technologies to mitigate the effects of a disrupted world and to enhance Kenya's regional and global competitiveness.

**Endorsement:**

**Conference/HLAP Chairman:** Prof. Raphael Munavu   
Name Signature 6<sup>th</sup> Aug. 2021

**Director General, NACOSTI:** Prof. Walter O. Oyawa   
Name Signature 6<sup>th</sup> Aug. 2021

**END**