REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

NATIONAL SCIENCE, TECHNOLOGY AND INNOVATION PRIORITIES

Science, Technology and Innovation: Driving Bottom-Up Agenda

September, 2023

KENYA VISION 2030

© National Commission for Science, Technology, and Innovation (NACOSTI)

Summary

Science, Technology and Innovation Priorities- 12 point

Table: 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;

#	Science, Technology and Innovation (STI) Priorities	Strategic Initiatives
1)	R&D Strengthening, R&D Priorities, R&D Financing and R&D Infrastructure	Strengthening Research and Development for public good through: setting of R&D Priorities, enhanced R&D activities, Measurement of R&D Impact, increased funding for R&D, and development of state-of-the-art R&D infrastructure
2)	Science, Technology and Innovation (STI) Education, Communication, Talent Development, and Next - generation Workforce	Innovating and enhancing Science, Technology and Innovation (STI) Education, Communication, and Talent Development, as well as fostering the next generation STI workforce
3)	STI Inclusivity, Advocacy, Diplomacy, and Policy Reviews	Promoting inclusivity in STI, advocating for science and technology, engaging in STI diplomacy, and regularly reviewing STI policies and Instruments.
4)	Technology Protection, Diffusion, and Commercialization	Fostering Technology Protection, Diffusion, and Commercialization through Strategic Investments in Manufacturing, Infrastructure, MSMEs, Start-ups, Technology Parks, and Smart Technologies
5)	Health Security, and Substance Abuse Mitigation (including Pharmaceuticals/Traditional medicine Production)	Addressing Health Security and mitigating substance abuse, through adaptation of one-health approach and development of locally-based pharmaceuticals and traditional medicine
6)	STI for Food Security, Nutrition, Smart Agriculture, and harnessing of indigenous knowledge and technologies	Leveraging STI for enhancing Food Security and Nutrition, promoting Smart Agriculture practices, and harnessing indigenous knowledge and technologies
7)	The Fifth Industrial Revolution, Digital Economy, Data Governance and Emerging/Frontier Technologies	Embracing the Fifth Industrial Revolution, advancing transformative Digital Economy, ensuring responsible Data Governance, and deploying Emerging/Frontier Technologies
8)	STI for SDGs, Climate Change Mitigation, and Harnessing of the Blue Economy/Aquatic Resources	Utilizing STI as a Game-Changer to achieve Sustainable Development Goals, mitigate Climate Change, and harness the vast potential of Blue Economy and Aquatic Resources
9)	STI for National Security, Public safety and Emergency Response	Applying STI for enhancing National Security, Public Safety, and Emergency Response capabilities
10)	STI Mainstreaming in Ministries, Departments, Counties, Institutions, and Agencies	Entrenching science, technology and innovation into the national production system for enhanced national security, public safety and inclusive sustainable development through Regulating, Coordinating, Promoting, Developing policy/governance/legal instruments, and Assigning priority to the progress of science, technology and innovation in the country benchmarked with global best practice.
11)	Strategic Multi-Agency, Multi-Sectoral, and International Cooperation and Partnerships	Building Strategic Multi-Agency, Multi-Sectoral, and International Cooperation and Partnerships in Science, Technology and Innovation (STI).
12)	STI for Sustainable Urbanization, County Development, and Resilient Communities	Leveraging STI for Sustainable Urbanization, County Development, and fostering Resilient Communities, including smart cities, circular economy, eco-housing, water and sanitation, and sustainable transport-energy-habitat systems.

1.0 Background

1.1 Preamble

Science, Technology and Innovation are key enablers for moving the world onto a sustainable path. In this regard, the National Commission for Science, Technology and Innovation (NACOSTI) continues to play its pivotal and central role of promoting, regulating, advising and coordinating all matters pertaining to Science, Technology and Innovation (STI) in Kenya in line with the STI Act. In particular, STI Act Section 6(1)(a) specifies that the Commission shall develop, in consultation with 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.

Taking cognizance of Global, Regional and National issues, the following are the proposed scientific, technological and innovation priority activities in Kenya in relation to the economic and social policies of the Government, and the country's international commitments. These have been informed by SDGs, STISA 2024, Africa's Development Agenda 2063, Constitution of Kenya 2010, MTP III (2018-2022) under Kenya Vision 2030, STI Act 2013, the Big Four Agenda and draft STI Policy. The proposed priorities in STI cover; R & D and Ethical issues; R&D facilities; STI infusion in county development plans; Investments and Financing STI and Research; Innovation, Technology Transfer and commercialization; Health & Bioeconomic Innovation; Leveraging STI for SDGs and Climate Change Action, Digital/Frontier Technologies to address SDGs and Disasters; Sustainable exploitation of Marine Science and Technology; Scientific data collection and management; STI Institutional Reforms; Multi-agency Framework, and Response Strategies; STEM education and Training; Building Next Generation STI Workforce; STI Communication, Outreach, Advocacy and Diplomacy; Strategic International scientific cooperation and partnerships; Security for Society. This is submitted for consideration by the Committee.

1.2 Science, Technology and Innovation System (STIS)

Science, Technology and Innovation System (STIS) is the network of institutions, infrastructure and policy frameworks in the public and private sectors whose activities and interactions initiate, import, modify and diffuse research, science, technology and innovation into the national production system and for connected purposes. STIS is a "system of systems" that integrates coordinates, and drives modern global and national discourse pertaining to Food Security, Public Safety, Health, National Security, and Economic Prosperity.

Science, Technology and Innovation System (STIS) founded on research is at the core of Kenya's development agenda as envisioned under Vision 2030 as it provides the competitive advantage to transform Kenya into a newly industrializing globally competitive and prosperous country with a high quality of life to all its citizens in a clean and secure environment. Accordingly, a well-structured STI System is not only essential but is the driver or pathway to enhanced Food Security, Public Safety and Inclusive Sustainable Development.

The National Science, Technology, and Innovation System (STIS) conceptual framework elucidates the key actors in the system, and how they interact, and by what mechanism, to achieve the objectives of the STI Policy Framework (see Figure 1.1). The system strongly asserts that science, technology and innovation are co-produced by networks of actors and can potentially be stimulated anywhere in the system by: education/research centres, businesses/industry, government action, publics, civil society, etc.). Further, a strong national STIS requires correct structuring or alignment of all the three sides of the “innovation success triangle”—the business environment, the regulatory environment, and the innovation policy environment. The interdependence of the various components implies that a well-functioning STIS needs every subsystem to work at a reasonable level of efficiency and effectiveness. Hence, the policy mix needs to be designed in a way that achieves the overall goals through a multi-sectoral or whole of government approach.

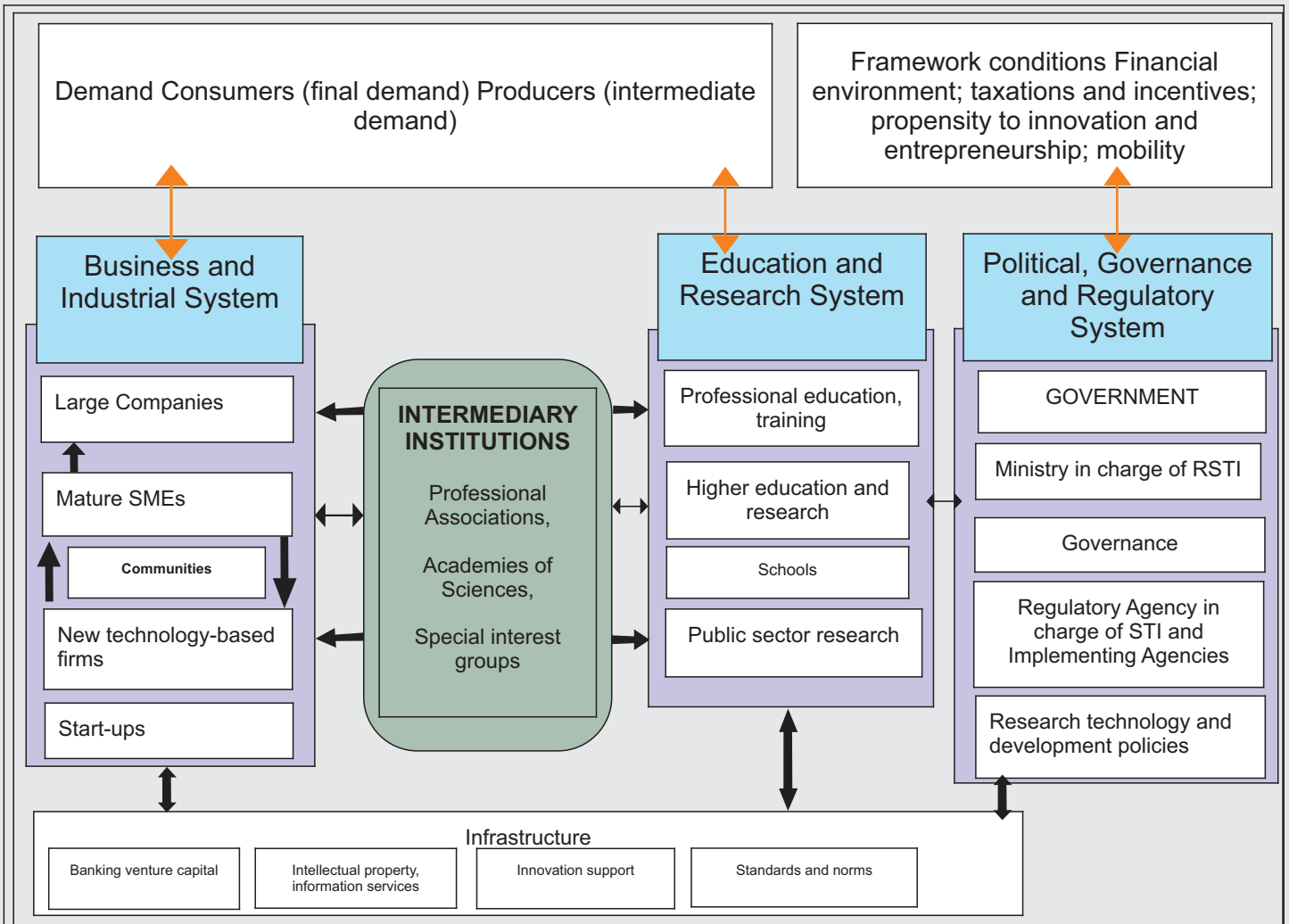

Fig. 1.1 Kenya Science, Technology and Innovation System

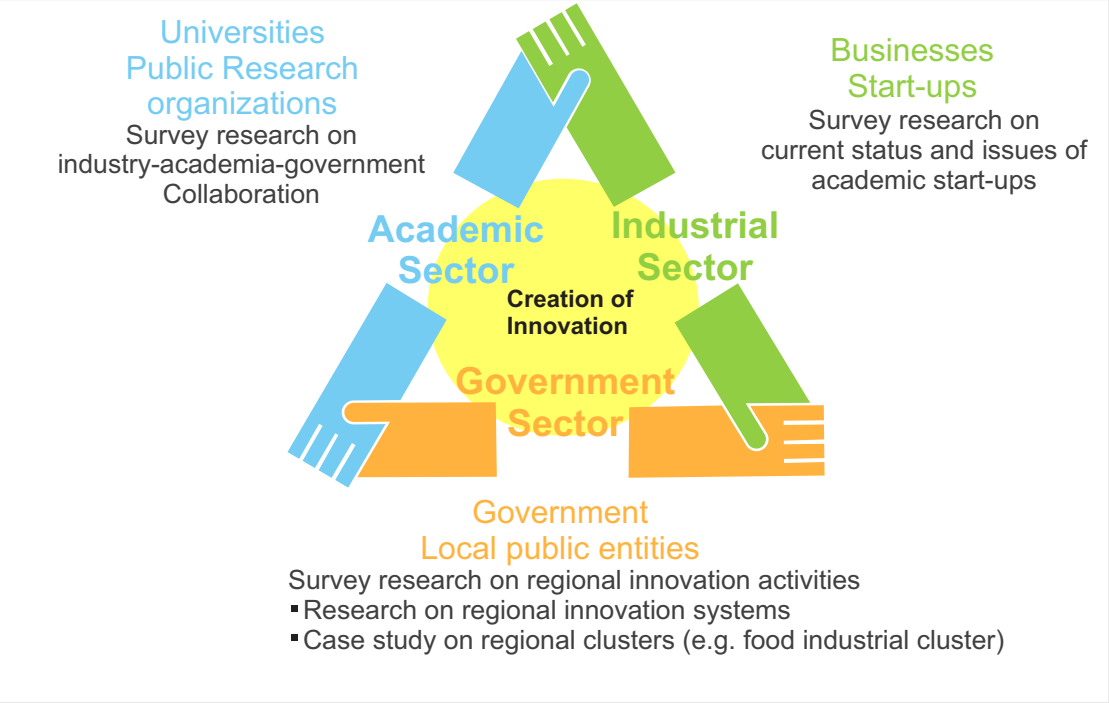

Fig. 1.2 Comparison with Science, Technology and Innovation System in Asia

1.3 Science, Technology, and Innovation Indicators

A major purpose for the Science, Technology and Innovation Act of 2013 (Rev. 2014) is to entrench science, technology and innovation into the national production system and for connected purposes. In the assessment of outcomes, there is need for clear and verifiable indicators. Indicators provide distinct measurement spectrum for realistic interpretation of data, and hence facilitates progress evaluation, determination of essential strategic statistical data for both formulations of public policies and investment in R&D, the detection and understanding of patterns or behaviour, as well as the identification of future trends, thus guiding informed decision-making. Any process without indicators is ineffective in any context. Therefore, before choosing which Science and Technology (S&T) indicators to use for each kind of project, it is important to review the indicator types available, taking cognizance that they are in constant evolution. In this regard, efforts have been geared towards evolving Kenya's STI indicators benchmarked with global best practices. The evolvement of Kenya's STI indicators has taken cognizance of several issues that include: The Globalization of research and innovation activities and networks, the need to build scientific knowledge capital, the need to train a unique workforce that is futuristic, Emerging multidisciplinary STI fields, the need to mainstream STI in MDAs, and the rapidly evolving STI landscape in the wake of COVID 19 Pandemic.

Current global approach has adopted STI Indicator Conceptual Framework that focuses on four key aspects/activities, viz **STI Framework Conditions, STI Investments, STI Innovation Activities and STI Impacts** (see Figure 1.3). The STI Indicator Conceptual Framework or STI Scoreboard facilitates the assessment of the research, science, technology, and innovation (Research Systems) framework, inputs, and performance in Kenya with the aim of documenting the current status, as well as highlighting relative strengths and weaknesses of the National Research System. The STI Indicator Conceptual Framework or STI Scoreboard is divided into four key aspects or activities, namely: Framework conditions, Investments, Innovation activities, and Impacts, and has 12 dimensions which may be actioned through a myriad of indicators.

The STI scoreboard outcomes is aimed at assessing the overall performance of Research, Science, Technology and Innovation (RSTI) in Kenya through consideration and scrutiny of indicators pertaining to:

- Research Investment and Workforce;
- Public Research and Development (R&D) Investment: Major Grants and Programmes;
- Education Advancement;
- Society & STI;
- Digital Infrastructure;
- Manufacturing and Services Sectors Innovation;
- Knowledge and Technology Intensive Industries;
- Energy and Green Technology;
- Bibliometrics: Publications and Citations;
- Intellectual Capital.

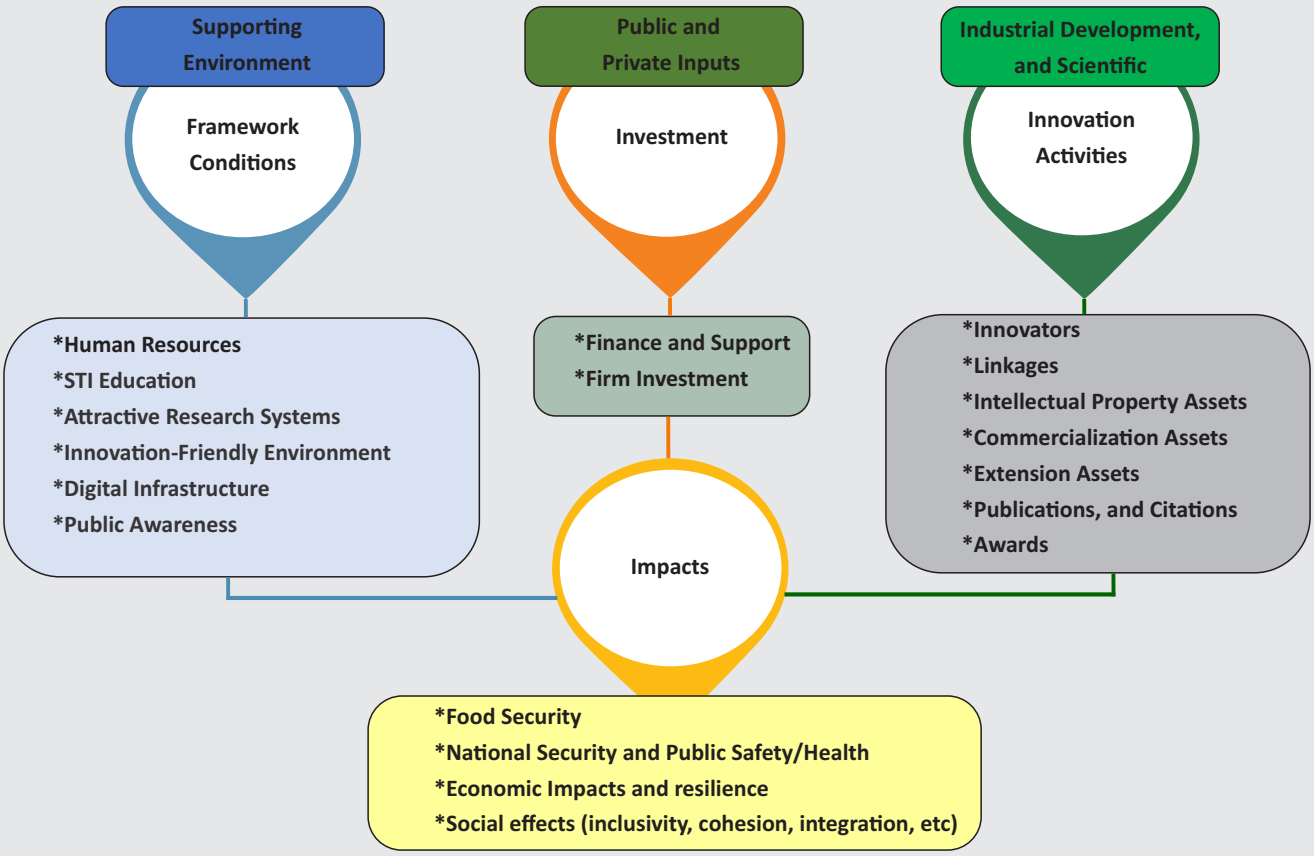

Fig. 1.3 STI Indicators Conceptual Framework

1.4 Whole-of-Government approach through Science, Technology, and Innovation Mainstreaming

Scientific discovery, technological breakthroughs, and innovation are the primary engines for expanding the frontiers of human knowledge and are vital for responding to global challenges and opportunities. Scientific innovation promotes sustainable economic growth and job creation, and improves the health of citizens, moves humanity towards a clean energy future, addresses global climate change, manages competing demands on environmental resources, and ensures national security. Accordingly, the need for a technology-driven innovation-led whole of government approach in contemporary national development and security systems is essential. Such a system must involve the interaction among key sub-systems in an intertwined fashion (see Fig. 1.4)

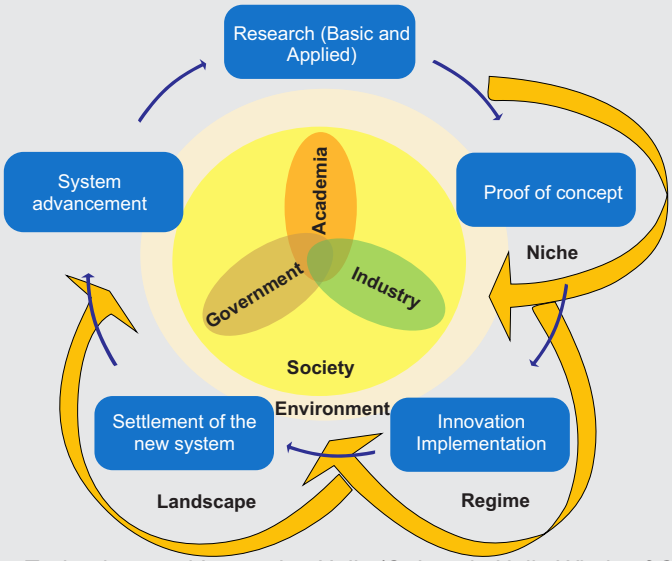

Fig. 1.4 Reframed Science, Technology and Innovation Helix (Quintuple Helix-Whole of Government Collaboration)

2.0 Research, Science, Technology, and Innovation Priorities

According to the Section 6(1) of the Science, Technology and Innovation Act 2013, the functions of the Commission shall be to:-

1. Develop, in consultation with 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;

Science, Technology and Innovation Priorities- 12 point

Table: 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;

#	STI PRIORITY AREA/INITIATIVE	BENCHMARKED WITH (COUNTRY/AGENCY)
1)	R&D Strengthening, R&D Priorities, R&D Financing and R&D Infrastructure	China, UK, Japan, US, Canada, Cambodia, SA
2)	Science, Technology and Innovation (STI) Education, Communication, Talent Development, and Next -generation Workforce	AAS, China, UK, US, Japan, India, Cambodia, S A, UN -ESC (CSTD), Korea
3)	STI Inclusivity, Advocacy, Diplomacy, and Policy Reviews	US, Canada, SA, UN -ESC (CSTD), Horizon Europe
4)	Technology Protection, Diffusion, and Commercialization	**GoK-MTPIV** , China, UK, Japan, US, Canada, Cambodia, SA, UN -ESC (CST D), Korea
5)	Health Security, and Substance Abuse Mitigation (including Pharmaceuticals/Traditional medicine Production)	**GoK-MTPIV** , Canada, AAS, UK, US, Canada, India, Cambodia, SA, Horizon Europe, AUDA -NEPAD
6)	STI for Food Security, Nutrition, Smart Agriculture, and harnessing of indigenous knowledge and technologies	**GoK-MTPIV** , Canada, AAS, Japan, India, Cambodia, S A, UN-ESC (CSTD), AUDA -NEPAD, Horizon Europe, Korea
7)	The Fifth Industrial Revolution, Digital Economy, Data Governance and Emerging/Frontier Technologies	**GoK-MTPIV** , Canada, AAS, China, UK, Japan, US, Canada, Cambodia, SA (4th IR), UN -ESC (CSTD), Korea
8)	STI for SDGs, Climate Change Mitigation, and Harnessing of the Blue Economy/Aquatic Resources	**GoK-MTPIV** , Canada, AAS, UK, US, Canada, India, SA, UN -ESC (CSTD),
9)	STI for National Security, Public safety and Emergency Response	UK, US, India, Canada, Korea
10)	STI Mainstreaming in Ministries, Departments, Counties, Institutions, and Agencies	**GoK-MTPIV** , Canada, UK, Japan, US, Canada, India, Cambodia, SA, UN -ESC (CSTD)
11)	Strategic Multi-Agency, Multi-Sectoral, and International Cooperation and Partnerships	Japan, Cambodia, US, Canada, SA, UN - ESC (CSTD), Horizon Europe, Korea
12)	STI for Sustainable Urbanization, County Development, and Resilient Communities	**GoK-MTPIV,** Japan, India, Canada, AUDA -NEPAD, SA

3.0 About NACOSTI

The National Commission for Science, Technology, and Innovation (NACOSTI) is a state corporation established under the Science, Technology, and Innovation Act,2013 (Revised 2014). NACOSTI is the successor to the National Council for Science and Technology (NCST) which was established by the Science and Technology Act, Cap 250 of the Laws of Kenya in 1977- this was repealed by the ST&I Act, 2013.

Mandate

The objective of the Commission is to regulate and assure quality in the science, technology and innovation sector and advise the government in matters related thereto

Vision

A Dynamic and Transformational Science, Technology, and Innovation System/Sector

Mission

To regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto

CORE FUNCTIONS

The functions of the commission are stipulated in section 6(1) of the Act as follows:

a) Develop, in consultation with 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.
b) Lead inter-agency efforts to implement sound policies and budgets, working in collaboration with the county governments, and organizations involved in science and technology and innovation within Kenya and outside Kenya.
c) Advise the national and county governments on the science, technology, and innovation policy including general planning and assessment of the necessary financial resources.
d) Liaise with the National Innovation Agency and the National Research Fund to ensure funding and implementation of prioritized research programs.
e) Ensure co-ordination and co-operation between the various agencies involved in science, technology, and innovation.
f) Accredit research institutes and approve all Scientific research in Kenya.
g) Assure relevance and quality of science, technology, and innovation programs in research institutes.
h) Advise on science education and innovation at both basic and advanced levels.
i) In consultation with the National Research Fund Trustees, sponsor national scientific and academic conferences it considers appropriate.
j) Advise the Government on policies and any issue relating to scientific research systems.
k) Promote increased awareness, knowledge, and information of research system.
l) Co-ordinate, monitor and evaluate, as appropriate, activities relating to scientific research and technology development.
m) Promote and encourage private sector involvement in scientific research and innovation and development.
n) Annually, review the progress in scientific research systems and submit a report of its findings and recommendations to the Cabinet Secretary.
o) Promote the adoption and application of scientific and technological knowledge and information necessary in attaining national development goals.
p) Develop and enforce codes, guidelines, and regulations in accordance with the policy determined under this Act for the governance, management and maintenance of standards and quality in research systems.
q) Undertake, or cause to be undertaken, regular inspections, monitoring and evaluation of research institutions to ensure compliance with set standards and guidelines.

Notes

NACOSTI PLAZA

National Commission for Science, Technology and Innovation

REPUBLIC OF KENYA

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