Science for prosperity

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY, AND INNOVATION

Reporting Framework for

Science, Technology and Innovation Mainstreaming Indicator

For

Performance Contracting FY 2021/2022

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ABBREVIATIONS

FY	-	Financial Year
GDP	-	Gross Domestic product
GoK	-	Government of Kenya
IT	-	Information Technology
MDAs	-	Ministries, Departments and Agencies
NACOSTI	-	National Commission for Science, Technology and Innovation
PC	-	Performance Contract
R&D	-	Research and Development
RSTI	-	Research, Science, Technology and Innovation
S&T	-	Science and Technology
STI	-	Science, Technology and Innovation
RTI	-	Research, Technology and Innovation

DEFINITIONS OF TERMS

Interpretation.
In this framework, unless the context otherwise requires-

"**Commission**" means the National Commission for Science, Technology and Innovation established under section 3 of the STI Act 2013;

"Incubation" means the maintenance of enabling environmental conditions for the purpose of facilitating the growth or development of infant technologies, ideas or industries;

"Industrial park" means an area designed and zoned for manufacturing and associated activities;

"Innovation" includes—

- a technovation model, utility model or industrial design within the meaning of the Industrial Property Act, 2001 (Cap. 509);
- a product, process, service or idea which is novel;
- an improved use of a new product, service or method in industry, business or society;
- indigenous or traditional knowledge by community of beneficial properties of land, natural resources, including plant and animal resources and the environment;
- any other non-patentable creations or improvements which may be deemed as deserving promotion and protection or *sui generis* intellectual property rights and "innovator" shall be construed accordingly;

"Principal Investigator" means the main researcher overseeing or conducting the research process;

"Researcher" means **a** person who engages in a scientific research;

'Research and experimental Development (R&D)" means creative work undertaken on a systematic basis in order to increase the stock of knowledge to devise new applications'. R&D includes all fields of S&T (natural sciences, engineering and technology, medical and health, agriculture and veterinary, humanities and social sciences), and covers three main activities: basic research, applied research and experimental development;

"Research system" means research, science, technology or innovation;

"Scientific research" means any investigation or research or inquiry or interview that aims to collect data or information, academic or non-academic, in areas of humanities or pure sciences or engineering or technology or for purpose of marketing survey or opinion polls that will lead to new knowledge or information;

"Science park" includes a technology park, science fair, and any other area designed and zoned for scientific or technological research and related activities;
"**STI Act**" means the Science, Technology and Innovation Act, 2013 (Revised 2017);

"Technology" means the application of knowledge to meet the goals, goods and services for sustainable development; and
"Traditional knowledge" means the wisdom developed over generations of holistic traditional scientific utilization of the lands, natural resources, and environment.

"**Intellectual property**" refers to All outputs of creative endeavour in any field at the Institution for which legal rights may be obtained or enforced pursuant to the law. IP may include:

a) Literary works, including publications in respect of Research results, and associated materials, including drafts, data sets and laboratory notebooks;
b) Teaching and learning materials;
c) other original literary, dramatic, musical or artistic works, sound recordings, films, broadcasts, and typographical arrangements, multimedia works, photographs, drawings, and other works created with the aid of Institution resources or facilities;
d) Databases, tables or compilations, computer software, preparatory design material for a computer program, firmware, courseware, and related material;
e) patentable and non-patentable technical information ;
g) Designs including layout designs (topographies) of integrated circuits;
h) Plant varieties and related information;
i) trade secrets;
j) Know-how, information and data associated with the above; and
k) Any other Institution-commissioned works not included above.

"Patent" means an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application.
"Trademark" refers to a sign capable of distinguishing the goods or services of one enterprise from those of other enterprises and is protected is protected by intellectual property rights.

"Utility model" also referred to as "short-term patent", it protects new technical inventions through granting a limited exclusive right to prevent others from commercially exploiting the protected inventions without consents of the right holders.

"Product" means a good or service (including knowledge-capturing products as well as combinations of goods and services) that results from a process of production.

"Commercialization" refers to any form of utilisation of IP intended to generate value, which may be in the form of a marketable product, process or service, commercial returns, or other benefit to society.

"Technology transfer" means the movement of data, designs, inventions, materials, software, technical knowledge or trade secrets from one organisation to another or from one purpose to another, guided by policies, procedures and values of each organisation involved in the process.

"Quadruple helix" refers to a research and innovation model that fosters engagement of key local actors from government, research and scientific institutions, companies and citizens, through bottom-up collaborative processes in innovation policy and challenges the traditional top-down policymaking process.

1. PREAMBLE

Investments in Science, Technology and Innovation (STI) is indispensable for any country or institution that seeks to secure national security, and leapfrog inclusive socio-economic development. Human progress and well-being has been based or dependent on advances in STI, as demonstrated through the 1st (water and steam power), 2nd (internal combustion engine and electricity), 3rd(electronics and IT) and currently 4th (fusion of the physical, digital, and biological worlds) Industrial Revolutions. More so now, the catastrophic impacts of COVID-19 Pandemic have devastated the entire world and brought to the fore the immense and life-saving role of STI as first responder in the global fight against the pandemic and future disasters, thus revealing the urgent need to mainstream and integrate STI strategies in programmes, projects, and systems of MDAs.

The Pandemic has reaffirmed the vital role of Science, Technology and Innovation, in evolving solutions through R&D to mitigate the corona virus while at the same time cushioning the impact on households. During the pandemic, it has been observed that developed countries that leveraged on emerging technologies e.g. Big Data, Artificial Intelligence (AI) and robots have been more successful in limiting the number of fatalities, while managing to keep most of their economies and societies operational. In this regard, the Government requires relevant MDAs to mainstream STI in their programmes and projects aimed at fast-tracking inclusive and sustainable national socio-economic development. The STI mainstreaming indicator in the Performance Contract for FY 2021/2022 will be supervised by the regulator of the STI sector, namely the National Commission for Science Technology and Innovation (NACOSTI), which is the Regulator for STI sector.

The National Commission for Science Technology and Innovation is a body Corporate established under the Science, Technology and Innovation Act, 2013 (Rev. 2017). The mandate of the Commission is **to regulate and assure quality in the science, technology and innovation sector and advise the government on matters related thereto**. Section 6 (1) of the Science, Technology and Innovation Act 2013, outlines seventeen (17) functions of the Commission which can be categorized into regulation, advisory, promotion and coordination.

During the Financial Year 2018/2019, the Commission in consultation with stakeholders developed the National Research Priorities (2018-2022) aligned to the Big Four Agenda in consultation with stakeholders to guide the country's research agenda for the realization of national development priorities as provided for in the Vision 2030, Third Medium-Term-Plan (2018-2022). The Research Priorities provide an implementation framework which emphasizes on coordination, cooperation and linkages between the government, universities, industry and civil society/community. NACOSTI has further developed STI policies and strategies, as well as STI indicators for the country.

The implementation of these policies, strategies, and priorities requires increased investments in research and development by all Government Ministries, Departments and Agencies

(MDAs). Section 32 (2) (a) of the STI Act provides that the National Research Fund will be allocated a sum of money amounting to two per cent of the country's Gross Domestic Product (GDP), provided by the Treasury every financial year. This has however not been achieved as reflected in the 2019 research and development survey which revealed that expenditure on R&D was at 0.77% of the GDP. Against this backdrop, the Government has introduced a performance indicator in the Financial Year 2021/22 on the STI mainstreaming to enable MDAs to impact on technology development and commercialization, and report on some of the national STI indicators under the core mandate.

1.1 Functions of NACOSTI

The functions of the Commission as per section 6(1) of the STI Act are to—

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 programmes;
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 programmes 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; and
q) undertake, or cause to be undertaken, regular inspections, monitoring and evaluation of research institutions to ensure compliance with set standards and guidelines.

2. PURPOSE

This Framework is meant to guide the implementation of STI Mainstreaming indicator in programmes and projects by public institutions.

3. SCOPE

This Framework applies to all public institutions with a component of research, science, technology and innovation in their mandate and functions. These include:

- Research Institutions, Universities, and University Colleges, as well as their regulating agencies
- Technical Vocational Education and Training (TVET)/Tertiary institutions focused on research, science, technology and innovation as well as their regulating agencies
- MDAs involved in the National Research Priorities Framework
- MDAs with distinct research and technology development centres/units/activities/budget.

The full list of MDAs that are eligible to implement this STI Mainstreaming performance indicator can be found on NACOSTI website: *www.nacosti.go.ke*

4. REPORTING, MONITORING AND EVALUATION

All MDAs are required to prepare and submit quarterly performance reports online to NACOSTI within 15 days following the end of a quarter and the annual performance reports within 15 days after the end of the contract period as per the Templates provided in section 6.

5. EVALUATION CRITERIA

During the 2021/22 FY the MDAs will be expected to report on STI mainstreaming sub-indicator under the core mandate.

No.	Sub-indicator	Score
	Preliminaries • Institutions to designate a Science, Technology and Innovation (STI) Focal person to steer STI mainstreaming and infusion within the MDAs and train the Focal person(s) and STI champions on matters of Research, Science, Technology and Innovation (RSTI). • Institutions to document information on human capacity, and Infrastructure/facilities in Research, Technology and Innovation as given in Table 1. These may be documented by sub-sector, qualification, field of research and technology innovation, age, and Gender	
1.	Develop the Institutional Science, Technology and Innovation (STI) Strategy using the template provided in Annex 1	30%
2.	Implement the developed Institutional STI Strategy by undertaking the following interventions, with a total score of 70 % distributed as below.	
	i. Document Research programmes/ projects in their respective institutions and funding Sources: Government (exchequer and A-in-A) and Donors (As per tables 1a and 1b)	10%
	ii. Ensure annual budgetary allocation for R&D is at least 2% of the operational budget (Provide total institutional budget and the total expenditure in R&D) (As per table 2)	10%
	iii. Undertake: Research and Development; Technology Development, protection, Transfer and commercialization; Innovation and Commercialization (As per table 3)	35%

	iv. Disseminate research findings/recommendations, and technology innovations through conferences, workshops, seminars among others (As per table 4)	15%
	Total	**100%**

6. REPORTING DETAILS OF THE SUB-INDICATORS

6.1 Designation and Training of Science, Technology and Innovation Focal Person

The targeted institutions will be expected to designate a suitable officer preferably in senior management to be the focal point for spearheading STI matters including the provision of the requisite STI data. The officer should have analytical IT skills and with good knowledge on Research, Technology, and Innovation (RTI). The contact details of the officer should be communicated to the Director General, National Commission for Science, Technology and Innovation.

The institution should also facilitate training, and capacity building of the focal person and identified STI champions in tandem with current best practice, and emerging issues in the STI Sector. NACOSTI will organize training for the identified STI focal point officer(s). The officer(s) will be trained on STI regulatory framework, relevant policy documents, STI priorities, strategy development, and emerging issues in STI as well as on how to collect and analyze the data and how to report on the same using the online web portal.

6.2 Develop the Institutional Science, Technology and Innovation (STI) Strategy

The institutional Focal Person(s) will spearhead the development of Institutional Science, Technology and Innovation (STI) Strategy which is aligned to global trends, Vision 2030, STI policies and strategies, National Research Priorities, and NACOSTI requirements, among others. Every institution shall put in place a clear organizational structure with definite responsibilities, systems, procedures, financial resources and facilities for implementing its projects or programmes. Further, an institution shall adhere to the code of ethics for the time being prescribed for the respective areas of research.

To ease the development of Institutional STI Strategy, a template has been provided in Annex 1.

6.3 Research, Technology and Innovation Programmes/Projects

Institutions will be expected to report on all research, technology and innovation projects undertaken during the FY 2021/2022. This may include long term projects and regional/international research, technology and innovation projects being undertaken within the Institution. Research, science and technology programmes and activities in institutions shall be considered relevant if they address national priorities and aspirations and reflect institutional mandates and ethics.

The reports will be as per the Tables 1a and 1b below.

Table 1a: All the Research Programmes/Projects being undertaken in the institution funded by the Government of Kenya

No.	Title of Programme/ Project	Principal Investigator, Co-PIs and their Institutions	Start date	End date	Status (Completed or Ongoing) (% of completion)	Source of Funding in KES		Total Funding
						GoK	Partners	
Total Funding								

Table 1b: Research Programmes/Projects being undertaken in the institution, and involving quadruple helix partnership with research institutions/universities/industry/private sector, and local communities/civil society.

No.	Title of Programme/ Project	Principal Investigator, Co-PIs and their Institutions	Start date	End date	Status (Completed or Ongoing) (% of completion)	Source of Funding in KES		Total Funding
						GoK	Partners	
Total Funding								

6.4 Research, Technology and Innovation Budgets/Inputs

This sub-indicator will require institutions to provide their annual budgets, actual expenditure and expenditure on R&D in the FY (*Development and Recurrent*). R&D funding is important element of funding the development of an innovative new product, service or process. R&D expenditure will include funding from donors/partners as indicated in table 2.

Table 2: Institutional Research, Technology and Innovation Expenditure

	Sources of funding	Total Recurrent Budget	Annual Operational Budget	Actual Operational Expenditure	Total Expenditure on R&D	% of R&D Expenditure to Operational Expenditure
1.	GoK Grants					
2.	Donors/Partners (specify) (a)					

	(b) (c) … ..					
3.	Appropriation in Aid (A-in-A) (specify) (a) (b) (c) … ..					
	Total					

6.5 Research, Technology and Innovation (RTI) Outputs.

These will include publications, patents, technologies, innovations developed, technology transfer, commercialization of products/services. MDAs are required to identify, implement and report on five (5) outputs from Table 3.

Table 3: Research Technology and Innovation Outputs.

No.	**Type of Research, Technology, and Innovation Output (in numbers)**	**Details of the products/services** ***(Indicate numbers/percentage etc)***	**Year developed/published /registered/granted**
1.	Publications (Recognized Peer reviewed journals/Books and book chapters)		
2.	Intellectual property (Patents, Trademarks and Utility models, registered/granted)		
3.	Technologies developed		
4.	Technologies Transferred		
5.	Innovations developed		
6.	Products developed		
7.	Commercialized products		
8.	Number of industrial linkages/MoUs developed		
9.	Technologies/innovations incubated		

6.6. Dissemination of Research, Technology, and Innovation Outputs

Dissemination of research outputs refers to the process of sharing research findings with stakeholders and wider audiences. Dissemination is an activity that can be targeted at academia as well as at broader audiences. One of the crucial characteristics is that dissemination facilitates research, technology and innovation uptake and understanding. It is a planned process that involves consideration of target audiences; consideration of the settings in which research findings are to be received; and communicating and interacting with wider audiences in ways that will facilitate research uptake in decision-making processes and practice. Institutions will be required to ensure that research is licensed as per provisions of the STI Act, and indicate how their research, technology and innovation outcomes have been disseminated as per table 4 below. Expected mode of dissemination include;

- Presentations in conferences, exhibitions, fairs, science and technology week,
- Publications in Recognized Peer reviewed scientific journals.
- Research reports, dissertations, theses, etc.
- Policy briefs, and advisories

Table 4: Dissemination of Research, Technology, and Innovation products/services

No.	Mode of dissemination	Details of the activity	Period undertaken
1.			
2.			

6.7 Human Resource Capacity, and Research, Technology and Innovation (RTI) equipment

(a) Human Resource Capacity

Institutions will be required to provide the numbers and qualifications of research, technology and innovation personnel in the institutions based on the five broad areas as specified in the Table below. The data will be submitted in the first quarter of the FY 2021/2022

Table 5a: Human Resource Capacity of the Institutions by specialty, qualifications, and gender

FIELD OF STUDY		QUALIFICATIONS					
		PHD		MASTERS		BACHELORS	
		M	F	M	F	M	F
1.	Natural Sciences						
2.	Engineering and Technology						
3.	Medical and Health Sciences						
4.	Agriculture and Veterinary Sciences						
5.	Humanities and Social Sciences						
Total							

Table 5b: Human Resource Capacity of the Institutions by specialty, qualifications, and age

FIELD OF STUDY		QUALIFICATIONS					
		PHD		MASTERS		BACHELORS	
		50 years and below	Above 50 years	50 years and below	Above 50 years	50 years and below	Above 50 years
1.	Natural Sciences						
2.	Engineering and Technology						
3.	Medical and Health Sciences						
4.	Agriculture and Veterinary Sciences						
5.	Humanities and Social Sciences						
Total							

(b) Research, Technology and Innovation (RTI) equipment

Institutions will be required to provide Research, Technology and Innovation equipment whose cost amounts to over Kshs 0.5 Million using the table below. The data will be submitted in the first quarter of the FY 2021/2022. However, any additional equipment acquired in subsequent quarters will be reported for the relevant quarter.

		Name of equipment	Laboratory name	Estimated cost of equipment. Kshs (millions)	Capability of the equipment
1.	Natural Sciences	(i) … (ii) … (iii)			
2.	Engineering and Technology	(i) … (ii) … (iii)			
3.	Medical and Health Sciences	(i) … (ii) … (iii)			

4.	Agriculture and Veterinary Sciences	(i) … (ii) … (iii)			
5.	Humanities and Social Sciences	(i) … (ii) … (iii)			
Total					

6.8 Status Report of the Institutional Scientific and Ethical Review Committee (ISERC)

An institution shall be required to establish an Institutional Scientific and Ethical Review Committee (ISERC) which shall be accredited by the Commission or be affiliated with an existing accredited ISERC in a University or a Registered Research Institution in Kenya.

An institution shall develop standard operating procedures and manuals to provide an optimum degree of order in research activities in their specific contexts and in line with international benchmarks recognized by the Commission. Where a researcher is found to have been negligent in the implementation of a research including failure to achieve the set objectives and outputs without reasonable cause, the Commission, on the advice of ISERC, may take appropriate action, which may include recommendation of suspension of funds, recovery of any misappropriated funds or legal action.

(1) Have you established an Institutional Scientific and Ethical Review Committee (ISERC)?
Kindly note that as part of transition, existing Institutional Ethics Review Committees (IERC) will be considered to be the same as Institutional Scientific and Ethical Review Committees (ISERC).

(Tick as appropriate)

Yes			No	

(2) Based on your answer to (1) above:

If "**No**", state the plans, strategies and timelines for establishing an Institutional Scientific and Ethical Review Committee (ISERC), or being affiliated with an existing accredited ISERC in a University or a Registered Research Institution in Kenya, within the next six months from the date of this report.

If "**Yes**", provide a summary report of the Institutional Scientific and Ethical Review Committee (ISERC) covering membership of the Committee, functions, number of meetings/activities undertaken in the preceding quarter and cumulatively, summary of cases handled in the preceding quarter and cumulatively, and concluding remarks (in a tabular format);

6.9 Research and Intellectual Property Policies

An institution shall put in place policies on Research, and Intellectual Property Rights in line with the relevant law(s) for the time being in force.

(1) Have you established Research, and Intellectual Property policies in line with the relevant law(s) for the time being in force?

(Tick as appropriate)

Yes			No	

(2) Based on your answer to (1) above:

If "**No**", state the plans, strategies and timelines for establishing Research, and Intellectual Property policies within the next six months from the date of this report.

If "**Yes**", list the evidence of staff sensitization on the Research, and Intellectual Property policies, as well as evidence of impacts of the same on the institution's mandate and service delivery to citizenry.

NB: In addition to quarterly reports, MDAs will be expected to submit an annual report in a format to be provided by the Commission.

ANNEX 1: Template for Institutional Science, Technology, and Innovation (STI) Strategy

1. Background

1.1 STI-Driven Inclusive Sustainable Socio-economic development

National strategies for Science, Technology and Innovation (STI) serve several functions in government policy making, namely;

(i) Articulation of the government's vision regarding the contribution of STI to a country's social and economic development.
(ii) Setting of priorities for public investment in STI and identify the focus of government reforms (e.g., university research funding and evaluation systems).
(iii) The development of these strategies can engage stakeholders ranging from the research community, funding agencies, business, and civil society to regional and local governments in policy making and implementation. In some cases, national strategies outline the specific policy instruments to be used to meet a set of goals or objectives. In others, they serve as visionary guideposts for various stakeholders.

In this regard, Science, Technology and Innovation (STI) Policies and Strategies in Kenya are geared towards the realization of the Country's long-term development goal of Vision 2030, through harnessing the opportunities within the STI sector and addressing challenges affecting the sector. Vision 2030 aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment. The vision is founded on intensification in the application of Science, Technology, and Innovation (STI) as an enabler to raise productivity and efficiency levels across the three pillars of Economic, Social and Political Progress. The Vision identifies programmes and key areas of interest under STI as;

- County Technology and Innovations Delivery Services Programme
- Coordination of the Technology, Innovation and Commercialization Programme
- Science, Technology, Engineering and Mathematics (STEM) Programme
- Energy Technologies Programmes:
- Nano-Sciences, Material Science and New Production Technologies Programme
- STI Performance Management Framework
- Enhancing Science, Technology and Innovation Awareness
- Intensification of Innovation in Priority Sectors
- Developing a Highly Skilled Human Resource Base
- Strengthening Technical Capacities and Capabilities

It is required that MDAs mainstream and infuse science, technology and innovation in all the sectors of the economy through carefully targeted investments on identified STI priority areas, as well as collaborations with key players in the sector comprising GoK-Academia-Industry/Private Sector-Communities/Civil Society. This will create a synergy and a strong

base for inclusiveness, enhanced efficiency, sustained growth and promotion of value addition in goods and services.

Further, Vision 2030 recognizes the critical role played by research and development (R&D) in accelerating economic development in all the newly industrializing countries of the world. Consequently, Kenya's national research institutes, universities, tertiary institutions, and non-governmental institutions are expected to generate and curator up to date knowledge and systems in different areas with varying levels of complexity and modernity, that have direct bearing on national well-being, safety, and security. Kenya intends to become a knowledge-led economy wherein, the creation, adaptation and use of knowledge will be among the most critical factors for rapid economic growth. New knowledge will play a central role in the nation's wealth creation and social welfare. Effective exploitation of knowledge is envisaged to provide a regime that will provide a package of incentives for the efficient use of the existing knowledge, creation of new knowledge, and flourishing entrepreneurship. An educated and skilled population will create, share, and use knowledge well in an effective innovation system at the research centres, universities, think tanks, private enterprises and community groups.

1.2 Objectives of National STI Strategies

The **main objective** of a National STI Strategy is to facilitate the transformation of the economy from a factor-based to a **knowledge-based** and **inclusive sustainable** economy that is **resilient** and provides a good quality of life for citizenry, thus uplift the well-being, safety, security, and inclusivity of Kenyans in national development discourse, as well as strengthen effectiveness and capability of institutions. This is to be achieved through mainstreaming the application of science, technology and innovation in all sectors, while simultaneously harnessing the opportunities within the STI sector and addressing challenges affecting the sector in order to maximize STI contribution to inclusive sustainable socio-economic development.

Accordingly, the strategic objectives of the National STI Strategy will be to facilitate the transformation of the country in **four core development thrusts**, by;

(i) Harnessing digital systems/frontier technologies to activate **a knowledge-based economy** through a people-process-Information infrastructure interaction,
(ii) Providing targeted and timely evidence-based knowledge, analysis, and advice, for a **resilient economy**,
(iii) Fostering **inclusive progress** through multi-sectoral, multi-disciplinary, multi-actor, and multigenerational involvement and partnerships that stimulate alternative forms of knowledge, expertise, and perspectives for scientific and technological advancement,
(iv) Evolving and availing apt scientific knowledge and technological innovation to expedite or leapfrog **sustainable growth/development**.

1.3 Guiding Principles of National STI Strategies

Effective implementation of STI Policies and Strategies will be guided by the following principles:

- Relevance to the country's Vision 2030 and the Constitution 2010;
- Quality, novelty and originality;
- Cost-effectiveness for desired results;
- Multi-disciplinary and cross-sectoral approach to problem-solving;
- Collaboration and partnership;
- Environmental conservation;
- Empowerment and participation of women, youth and persons with disabilities;
- Equity and inclusiveness;
- Evidence based; and
- Good governance.

1.4 Strategic issues/operational priorities for STI

The National STI Policy outlines ten (10) Strategic issues through which the MDAs will deliver on their promise to citizenry, viz, to uplift the well-being, safety, security, and inclusivity of Kenyans in national development.

The Strategic issues are as follows:

i. Legal and institutional framework;
ii. Human resource development;
iii. Education, training and research;
iv. Funding (Investments in) STI;
v. Technology development, transfer and diffusion;
vi. Infrastructure for science technology and innovation;
vii. STI Advocacy and Awareness
viii. Collaborations and Partnerships in Science, Technology and Innovation
ix. Gender Mainstreaming in STI
x. Performance Management

MDAs will consider the above identified strategic issues in addition to other issues relevant to their mandate

1.5 Implementation Framework of National STI Strategies

The National STI strategy will be implemented through a multi-sectoral, and incremental approach, and will be oversighted by the Ministry for the time being in charge of science, technology and innovation. NACOSTI will coordinate implementation of joint action plans and activities of MDAs in the STI eco-system in the spirit of continuous improvement. MDAs are

expected to customize and develop their institutional implementation framework and action plans for their STI Strategy, in accordance with its organizational objectives. MDAs will review their strategies after every five years, taking cognizance of its success in meeting the established objectives, as well as evolution of the strategic context.

1.6 MDAs that fall under the core mandate of STI Mainstreaming and Infusion

The MDAs that fall under the core mandate of STI Mainstreaming and Infusion are;

(1) Research Institutions, Universities, and University Colleges, as well as their regulating agencies
(2) Tertiary institutions focused on STI as well as their regulating agencies
(3) MDAs involved in the National Research Priorities Framework
(4) MDAs with a distinct research and technology development centre/unit.

1.7 Conceptual Framework of the National STI Strategy

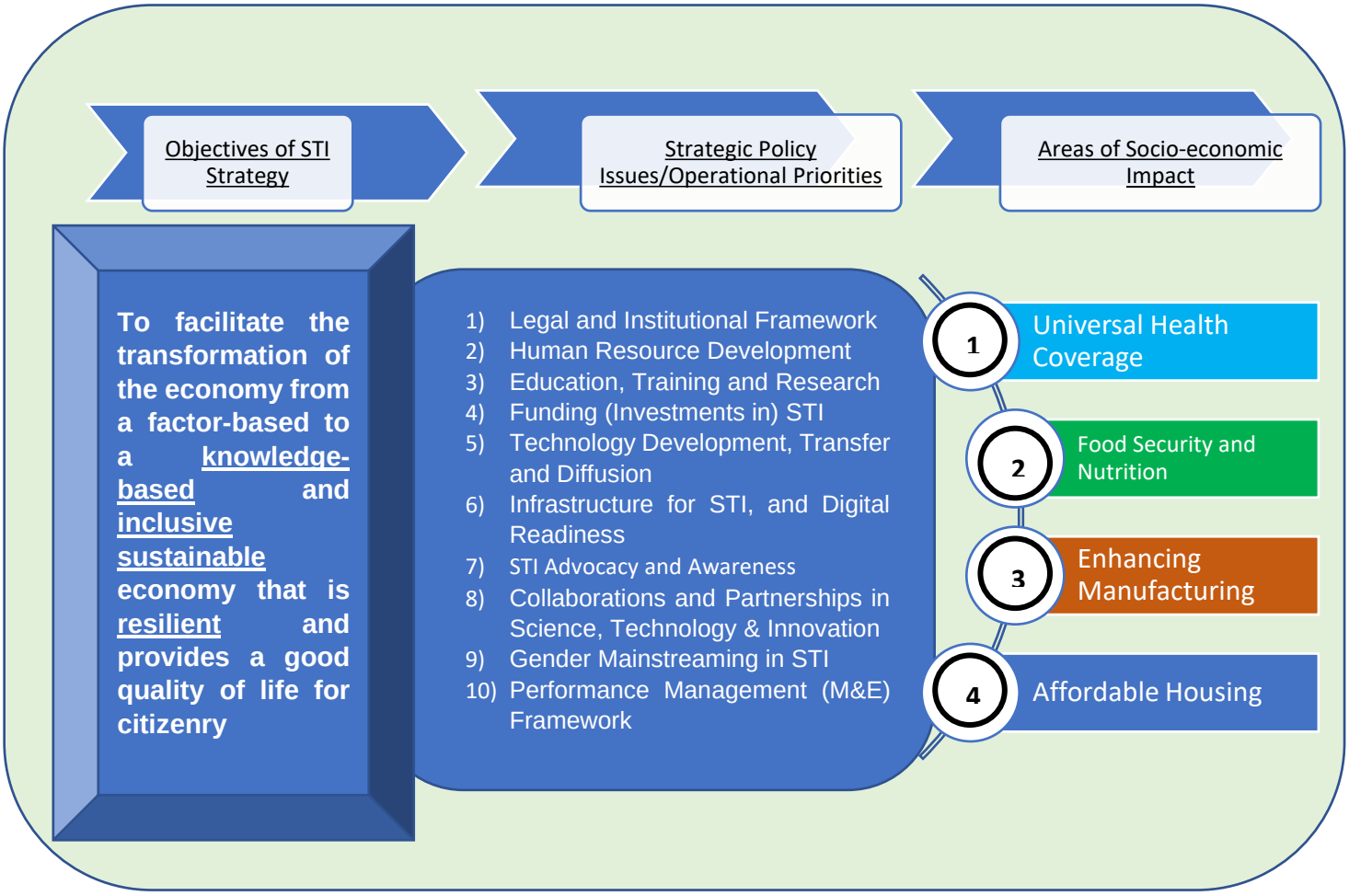


Fig. 1: Conceptual Framework, and Key Elements of the National STI Strategy

2. MDA Situational Analysis, and Rationale

2.1 Situational Analysis

Undertake a situational analysis of STI in the MDA based on STI Strategic/Operational Priorities, vis-a-viz the current status of STI in the country and taking cognizance of STI Indicators developed by NACOSTI and available data.

For example;

Strengths

1. Experience and leadership position in the EU Framework Program: Horizon 2020.

2. Knowledge of the scientific, technological and productive capacities of our country, as a result of the process of elaboration and monitoring of the regional smart specialization strategies (RIS3).

3. Investment in Centres of Excellence, Health Research Centres, Singular Scientific-Technical Infrastructures (ICTS) and participation in international facilities.

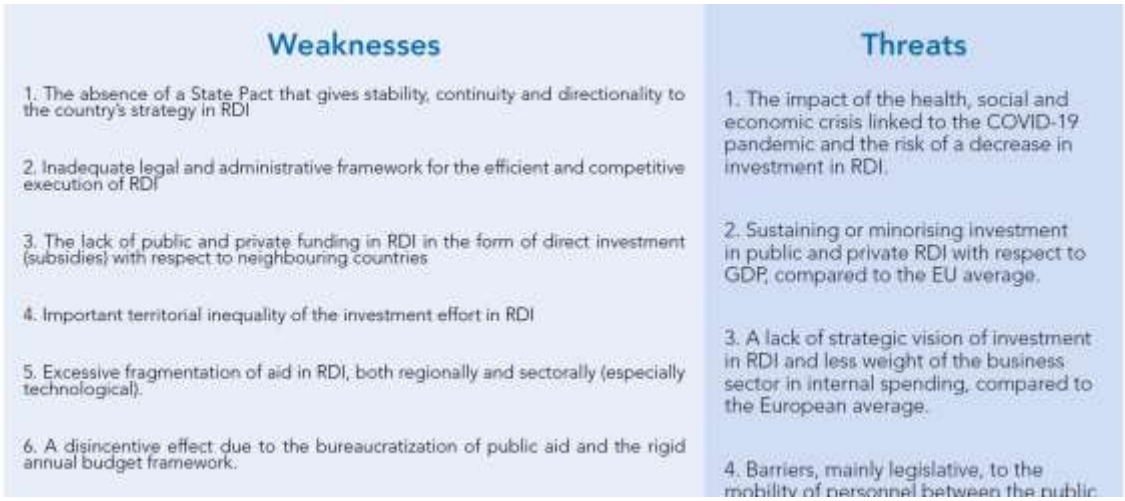
Opportunities

1. The global crisis of COVID19 has shown the importance of science and innovation for the well-being and development of society.

2. Key role of science and innovation in achieving the SDGs.

3. The weight of Spanish SMEs in RDI activity is higher than that of other neighbouring countries, which could lead to greater flexibility and adaptation of innovative activities.

Etc.



Weaknesses

1. The absence of a State Pact that gives stability, continuity and directionality to the country's strategy in RDI

2. Inadequate legal and administrative framework for the efficient and competitive execution of RDI

3. The lack of public and private funding in RDI in the form of direct investment (subsidies) with respect to neighbouring countries

4. Important territorial inequality of the investment effort in RDI

5. Excessive fragmentation of aid in RDI, both regionally and sectorally (especially technological).

6. A disincentive effect due to the bureaucratization of public aid and the rigid annual budget framework.

Threats

1. The impact of the health, social and economic crisis linked to the COVID-19 pandemic and the risk of a decrease in investment in RDI.

2. Sustaining or minorising investment in public and private RDI with respect to GDP, compared to the EU average.

3. A lack of strategic vision of investment in RDI and less weight of the business sector in internal spending, compared to the European average.

4. Barriers, mainly legislative, to the mobility of personnel between the public

Etc.

2.2 Rationale of the Institutional STI Strategy

Specify Rationale of the Institutional STI Strategy.

3. Developing MDA STI Strategic Orientation

3.1 Preamble

MDAs may utilize and customize the National STI Orientation in developing their Institutional STI Strategy (**Annex A below**). The template provided below is meant to guide MDAs in developing their Institutional STI Strategy.

3.2 Developing MDA Institutional STI Strategy

3.2.1 Mandate and Vision of MDA

Table 1 Mandate, Vision and Field of Focus of MDA

Name of MDA	*Specify*	*Remarks (if any)*
Type of MDA	*Tick as appropriate* Research Institutions, Universities, and University Colleges, as well as their regulating agencies Tertiary institutions focused on STI as well as their regulating agencies Other MDAs involved in the National Research Priorities Framework Other MDAs with distinct research and technology development centre/unit/activities/budget. Other (specify)	
Mandate of MDA	*Specify*	
Vision of MDA	*Specify*	
Field of focus of MDA	Natural Sciences Engineering and Technology Medical and Health Sciences Agriculture and Veterinary Sciences Humanities and Social Sciences Multi-disciplinary (specify) Other(s) (specify)	

3.2.2 Objectives of the Institutional STI Strategy

Specify

3.2.3 Guiding Principles of the Institutional STI Strategy

Specify

3.3 STI priority areas, policies and strategies in line with National Priorities

The Institutional priority areas, policies and strategies in line with National Priorities shall be aligned to the Big Four Agenda, the National Strategic Policy Issues, the National priorities in scientific, technological and innovation activities in Kenya, the National Research Priorities Framework, the National STI Indicators, and global trends in STI, among others.

Specify using Tables below

Table 2: STI Priority areas for MDA

List the identified Priority area(s) of Development relevant to the MDA.	*E.g.* • *Vision 2030 (give details)* • *The Big Four Agenda (give details)* • *SDGs (give details)* • *Mitigating COVID 19 pandemic (give details)*

Based on identified Priority areas of Development relevant to the MDA, list the strategic policy issues relevant to the MDA, corresponding policy statements, and strategies for Research, Science, Technology, and Innovation in the Table below;

Table 3: STI policies and strategies for MDA in line with National Priorities

S. No.	**Strategic Policy Issues**	**Policies** ***(Specify as pertains to the MDA)***	**Strategies for Research, Science, Technology, and Innovation** ***(Specify as pertains to the MDA)***
(1)	Legal and Institutional Framework	*E.g.* *The institutional governance of STI will be strengthened*	*E.g.* • *Create an STI Desk/Committee* • *Promote effective coordination, gender equity, inclusiveness, and partnership in STI.*
(2)	Human Resource Development	*E.g.* *The quality and capacity of the human resource and talent management will be enhanced*	*E.g.* • *Increase RTI personnel (PhDs and Masters level) by …x% of current RTI personnel* • *Enhance gender parity and inclusion in STI programmes;* • *Provide mechanisms to attract and retain human resource in STI;*
(3)	Education, training and research	*E.g.* *Education, training and research programmes will be re-aligned to national goals*	*E.g.* • *Promote gender equality, cultivate and sustain interest in STEM at all levels of education.*

		and regional/counties and industry needs	• *Adopt a continuous review and implementation of the education curriculum to respond to the needs of the S&T sector* • *Develop a mechanism for recognizing and rewarding achievement in Research* • *Develop programmes with industry to strengthen technological capabilities* • *Participate in conferences, exhibitions/fairs, STI networks* • *Ensure all Research licensed as per statutory provisions,* • *Ensure research is aligned to the National Research Priority areas* • *Publish scientific papers in approved refereed journals*
(4)	Funding (Investments in) STI	*E.g.* *Mechanisms for sustainable financial resource mobilization and investment in STI will be developed*	*E.g.* • *Develop a framework for resource mobilization* • *Invest .x% of Budget on R&D, Research Chairs Programmes, Technology & Innovation, Centre of Excellence, Science & Technology Parks, and/or Incubation Centres, Technology and Innovation activities.*
(5)	Technology development, transfer and diffusion	*E.g.* *The Intellectual Property Rights Regime will be strengthened* *Innovation incubation centres and Science & Technology Parks will be established*	*E.g.* • *Develop and implement a National Intellectual Property Policy* • *Create awareness on the importance of Intellectual Property Rights;* • • *Align Technology Development activities to National Priorities* • *Submit applications for Patents, and Register utility models* • *Strengthen industry-academia linkages to encourage commercialization, venture capitalists, and spin-offs;* • *Establish technology transfer, and industrial liaison offices;* • *Participate in annual conferences, exhibitions, science weeks, and expert dialogues pertaining STI;*
(6)	Infrastructure for STI, and Digital Readiness	*E.g.* *STI infrastructure to support Programmes in priority areas will be enhanced and strengthened*	*E.g.* • *Establish the status of STI infrastructure and Digital readiness* • *Allocate funds for the expansion of STI infrastructure*
(7)	STI advocacy and awareness	*E.g.* *STI advocacy and awareness will be enhanced*	*E.g.* • *Support and coordinate annual conferences, science weeks, congresses, STI Olympiads, STEM mentorship programmes, exhibitions, fairs and expert dialogues on the role and state of STI* *Engage with the County Governments on STI-based innovative county development strategies and programmes*

(8)	Collaborations and partnerships in Science and Technology	*E.g.* • *Establish strategic collaborations and partnerships at national, regional and international levels.* • *Strengthen existing collaborations and partnerships at national, regional and international levels;*	*E.g.* • *Participate in STI networks at national, regional and international levels;* • *Establish multidisciplinary and multi-institutional teams for collaborative research and development.*
(9)	Gender Mainstreaming	*E.g.* *Gender equality will be promoted in all STI related programmes and activities, and in decision making*	*E.g.* • *Ensure gender equality in participation and distribution of opportunities in STI*
(10)	Disability Mainstreaming	*E.g.* *Equality will be promoted in all STI related programmes and activities, and in decision making*	*E.g.* *Ensure equality in participation and distribution of opportunities in STI*
(11)	Performance management (M&E) framework	*E.g.* *Monitoring and Evaluation (M&E) of STI programmes will be strengthened, and reports submitted to relevant agency(ies)*	*E.g.* • *Develop and implement monitoring and evaluation tools and STI performance indicators* • *Submit quarterly and annual reports pertaining to STI to NACOSTI in an approved format, and provide any relevant evidence that may be required.*
(12)	Others (Specify)		

3.4 Implementation Framework of the Institutional STI Strategy

Specify using Tables below

Table 4

Sector Goal: *e.g* **To transform the national economy into a knowledge-based economy**					
Policies and Strategies	**Expected Results**	**Performance Indicators**	**Means of Verification**	**Indicative Targets and Time Frames**	**Estimated costs in Millions (Ksh.)**
e.g **Policy 1*:* The Government will establish an institutional and regulatory framework to promote, coordinate, mobilize resources and manage ST&I**	**ST&I policy and legal framework developed**	**% Completion of ST&I policy and legal framework**	**ST&I policy ST&I Act**	**100% completion by 2016**	
e.g **Strategy 1.1**: Mainstream ST&I in all sectors of the economy both at national and county government levels;	ST&I integrated in all Sectors of the economy	No. of ST&I programmes in the sectors; % of budget allocated to ST&I programmes in the sectors	Sectors reports; Budget estimates	At least one ST&I programme integrated and funded by all sectors by 2017;	

Specify

4. Monitoring and Evaluation

4.1 General

The main objective of a National STI Strategy is to facilitate the transformation of the economy from a factor-based to a **knowledge-based** and **inclusive** **sustainable** economy that is **resilient** and provides a good quality of life for citizenry, thus uplift the well-being, safety, security, and inclusivity of Kenyans in national development discourse, as well as strengthen effectiveness and capability of institutions. This is to be achieved through mainstreaming the application of science, technology and innovation in all sectors, while simultaneously harnessing the opportunities within the STI sector and addressing challenges affecting the sector in order to maximize STI contribution to inclusive sustainable socio-economic development. Further, the national STI enterprise must be able to meet rapidly evolving challenges, threats, establish and maintain strategic partnerships, employ swiftly changing technologies, cope with diminishing resources, and benefit from accelerating globalization. In this regard, the Kenya STI enterprise has to draw its strength from collaboration and partnerships that are intertwined and inclusive of the government/state agencies, the academia, the industry, civil societies/NGOs.

MDAs are expected to specify mechanisms for M&E, and to undertake the same on a quarterly basis.

4.2 Undertaking M&E and submission of reports

- An MDA will prepare and implement internal mechanism for M&E, and report on a quarterly and annual basis to the Commission

a) External M&E– NACOSTI

- The Commission will undertake M&E of selected MDAs, and collate reports received from MDAs to facilitate preparation of an annual report on the state of Research Systems (Research, Science, Technology or Innovation) for submission to the Cabinet Secretary
- The Commission will review the tool after every five years, or when need arises.

ANNEX 2: National Science, Technology, and Innovation (STI) Strategic Orientation

A2.1 National STI Policy issues, Strategies, and Implementation Framework

STI Policy Statements, and Strategies

Currently, Science, Technology and Innovation (STI) Policies and Strategies in Kenya prioritizes the following strategic issues or priority STI delivery channels, and stipulates corresponding strategies/action points:

(1) Legal and institutional framework;

Policy statement: The Legal framework and governance of STI will be strengthened by employing the following strategies:

(a) Review and harmonize the existing legal and regulatory framework;
(b) Strengthen governance framework for effective integration of STI in all sectors of the economy;
(c) Promote effective coordination, gender equity, inclusiveness, and partnership in STI.
(d) Develop an implementation framework for Programmes and Projects
(e) Strengthen mechanisms for implementation of international obligations in STI

(2) Human resource development;

Policy statement: The quality and capacity of the human resource and talent management will be enhanced by employing the following strategies:

a) Establish and regularly update an STI skills inventory;
b) Enhance gender parity and inclusion in STI programmes;
c) Provide mechanisms to attract and retain human resource in STI;
d) Promote and strengthen research programmes and sector working groups in prioritized STI areas;

(3) Education, training and research;

Policy statement: Education, training and research programmes will be re-aligned to national goals and regional/counties and industry needs by adopting the following strategies:

a) Provide modern infrastructure and equipment in education and research institutions;
b) Adopt a continuous review and implementation of the education curriculum to respond to the needs of the S&T sector;
c) Establish centres of excellence that promote science, research and development, innovation, commercialization, knowledge sharing, and creativity;
d) Establish science centres including museums to inculcate STI culture

e) Develop mechanisms for identifying, tapping and nurturing talent in STI sector;
f) Develop programmes with industry to strengthen technological capabilities through partnership and linkages with institutions of higher learning and research institutions;
g) Develop a mechanism for recognizing and rewarding achievement in STI; and
h) Promote gender equality, cultivate and sustain interest in STEM at all levels of education.

(4) Funding (Investments in) STI;

Policy statement: Mechanisms for sustainable financial resource mobilization and investment in STI will be developed by employing the following strategies:

a) Develop a framework for resource mobilization and utilization for STI;
b) Mobilize 2% of GDP annually to the STI sector;
c) Enhance institutional, national, regional and international collaborations and partnerships to increase investments in STI;
d) Strengthen the capacity of the NRF to mobilize funds for research;
e) Develop guidelines and sensitize County Governments to prioritize STI in resource allocation;
f) Strengthen gender equality and inclusiveness in funding for STI programmes
g) Develop an incentive framework to attract private sector investment in R&D; and
h) Harmonize policies, planning and budgeting of the STI sector.

(5) Technology development, transfer and diffusion;

Policy statements:

- Innovation incubation centres and Science & Technology Parks will be established, in collaboration with County Governments, will be established to promote entrepreneurial development and talent management;
- The Intellectual Property Rights Regime will be strengthened;
- Development, transfer and diffusion of ideas and knowledge into products and processes will be promoted; and
- An enabling environment for sustainable utilization of Indigenous Resources and Traditional Knowledge will be provided.

In order to implement the above policies, the following strategies will be adopted:

a) Develop and implement a National Intellectual Property Policy;
b) Review the Intellectual Property Rights regime to facilitate the verification, acquisition and protection of indigenous resources and knowledge;
c) Create awareness on the importance of Intellectual Property Rights;
d) Strengthen industry-academia linkages to encourage commercialization, venture capitalists, and spin-offs;
e) Promote the establishment of technology transfer, and industrial liaison offices;

f) Strengthen the capacity of NACOSTI, NRF and KENIA to facilitate technology development, transfer, diffusion and commercialization both at the National and county government level;
g) Support annual conferences, exhibitions and expert dialogues on the state of STI;
h) Facilitate research institutions to develop institutional IPR policies;
i) Develop quality standards and enhance accreditation of testing and calibration laboratories;
j) Promote the establishment of business incubators and science & technology parks;
k) Establish an innovation database on technology acquisition and transfer;
l) Document the extensive indigenous resources and traditional knowledge;
m) Promote sustainable utilization and conservation of indigenous resources and traditional knowledge;
n) Promote local inventions and innovations; and
o) Provide support for increased technology transfer to MSMEs.

(6) Infrastructure for science technology and innovation;

Policy statement: STI infrastructure to support Programmes in priority areas will be strengthened by employing the following strategies:

a) Establish the status of STI infrastructure in the identified priority areas;
b) Provide adequate STI infrastructure in education, training and research institutions;
c) Establish mechanisms for sharing R&D infrastructure amongst institutions; and
d) Promote infrastructural compliance with the needs of all groups to address gender inequalities and marginalization.

(7) STI advocacy and awareness

Policy statement: STI advocacy and awareness will be enhanced by employing the following strategies:

a) Create awareness on the importance and critical role of STI in sustainable and inclusive national development agenda;
b) Support and coordinate annual conferences, science weeks, congresses, STI Olympiads, STEM mentorship programmes, exhibitions, fairs and expert dialogues on the role and state of STI;
c) Engage with the County Governments on STI-based innovative county development strategies and programmes
d) Promote science culture among the Kenyan populace by availing updated information on the role and impacts of STI in daily life
e) Institute measures geared towards mainstreaming diversity in STI education and careers
f) Re-structure STI advocacy and awareness programmes and coordination approach to attract interest among diversified groups of stakeholders with segmented message and promise for each group
g) Increase investments and resources for STI advocacy and awareness

(8) Collaborations and Partnerships in Science, Technology and Innovation

Policy statements:

- Establish strategic collaborations and partnerships at national, regional and international levels;
- Strengthen existing collaborations and partnerships at national, regional and international levels; and
- Promote collaborations and partnerships at national, regional and international agencies in advancement of STI.

In order to implement the above policies, the following strategies will be adopted:

a) Promote participation in STI networks at national, regional and international levels;
b) Facilitate acquisition and development of new and emerging technologies;
c) Establish an STI forum that is inclusive of the Kenya Diaspora and descendants;
d) Promote the participation for the Kenyan diaspora in national development
e) support public agencies that are already engaged in international and regional treaties and cooperative agreements; and
f) Promote the establishment of multidisciplinary and multi-institutional teams of experts for collaborative research and development.

(9) Gender mainstreaming in STI;

Policy statement: Gender equality will be promoted in all STI related programmes and activities, and in decision making by adopting the following strategies:

a) Ensure gender equality in participation and distribution of opportunities and benefits of STI;
b) Design and initiate affirmative action initiatives to ensure gender equality and inclusiveness in STI related programmes, activities, and in decision making and planning;
c) Design and implement sensitization of the general public and key stakeholders (policy makers, research, civil society, local communities, academia, faith-based organizations, NGOs, students etc.) on the relevance of gender equality in STI;
d) Incentivize STI education and training for the underrepresented gender at all levels of schooling (primary, secondary and tertiary), including public and private sector institutions in order to facilitate the equal participation in STI;
e) Review the educational curricula at all levels to build capacity for the achievement of gender equality and to comply with the constitutional provisions and other legislative requirements, regional and international standards;
f) Facilitate gender responsive entrepreneurship training to enhance the ability and capacity to innovate, utilize, and commercialize STI;
g) Promote mentorship programmes in schools and sensitize households to encourage girls to take up STEM related careers;
h) Improve collection, analysis, storage and dissemination of disaggregated data by age and gender in STI; and

i) Ensure gender equality in budgetary allocations and distribution of other resources for STI programmes at institutional, county and national government levels.

(10) Performance management framework

Policy statement: Monitoring and Evaluation (M&E) in the STI Sector will be strengthened by adopting the following strategies:

a) Strengthen the human resource capacity of the STI actors to undertake M&E;
b) Develop and implement monitoring and evaluation tools and STI performance indicators that are integrated in the annual plans and development planning processes at institutional, county and national government levels;
c) Enhance the collection, collation and analysis of sex disaggregated data to inform policies, planning and decision-making;
d) Institutionalize STI surveys in the sector;
e) Develop and implement an efficient web-based monitoring and evaluation system.
f) Develop and implement a globally benchmarked performance management framework; and
g) Establish a framework for ranking of STI institutions and universities as a measure of contribution to national development and global competitiveness.

STI Policy Institutional/Implementation Framework

(1) MDAs, County Governments, Research Institutions, and institutions of higher learning will develop the necessary science, technology and innovation capacities, as well as R&D competence for effective mainstreaming and infusion of STI in national development. They will further generate, curate, and disseminate new knowledge and technologies to inform product development and service provision. Further, MDAs, County Governments, Research Institutions, and institutions of higher learning will align their institutional work plans with the implementation Plan for STI policies and strategies.

Further, MDAs, County Governments, Research Institutions, and institutions of higher learning shall be guided by the following principles—

(i) the promotion of socio-economic development in line with the country's development agenda;
(ii) achievement of manpower development and skills acquisition;
(iii) promotion of knowledge creation, storage and dissemination;
(iv) development of research, and innovation and the application of innovation to development; and
(v) contribution to community service.

(2) The Ministry in charge of Science, Technology and Research will be responsible for policy development, and Policy monitoring and evaluation, and will oversee activities of the STI sector. Further, the Ministry/National Government/County Government, acting on the

recommendation of NACOSTI, will designate Centres of Excellence (COEs) within the STI sector in identified national priority areas.

(3) In line with the STI Act 2013 (Rev. 2014), the National Commission for Science, Technology and Innovation (NACOSTI), whose mandate is to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto, shall (among other functions);

(i) Guide the STI Sector/MDAs on 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) Ensure co-ordination, synergies and co-operation between the various agencies and partners involved in science, technology and innovation, and shall establish and coordinate a Science, Technology, Innovation and Research Network
(iii) 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
(iv) liaise with the National Innovation Agency (KENIA) and the National Research Fund (NRF) to ensure funding and implementation of prioritized research programmes
(v) in consultation with the National Research Fund Trustees, sponsor national scientific and academic conferences it considers appropriate;
(vi) co-ordinate, monitor and evaluate, as appropriate, activities relating to scientific research and technology development;
(vii) promote and encourage private sector involvement in scientific research and innovation and development;
(viii) annually, review the progress in scientific research systems and submit a report of its findings and recommendations to the Cabinet Secretary;
(ix) promote the adoption and application of scientific and technological knowledge and information necessary in attaining national development goals
(x) develop and enforce codes, guidelines and regulations in accordance with the policy determined under the STI Act for the governance, management and maintenance of standards and quality in research systems;
(xi) shall establish Advisory Science, Technology, Innovation and Research Committees.

(4) The private sector will play a key role in the implementation of this policy. This will include establishment of public private partnerships and venture capital with actors in the STI sector.

A2.2 National Science, Technology, and Innovation (STI) Priority Activities

In line with the STI Act 2013 (Rev. 2014), and taking cognizance of Global, Regional and National issues, NACOSTI has identified the following as the 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, the Big Four Agenda, and STI Policies and Strategies. The identified STI priority activities comprise;

(i) R & D and Ethical issues;
(ii) R&D facilities;
(iii) STI infusion in county development plans;
(iv) Investments and Financing STI and Research;
(v) Innovation, Technology Transfer and commercialization;
(vi) Health & Bioeconomic Innovation;
(vii) Leveraging STI for SDGs and Climate Change Action;
(viii) Digital/Frontier Technologies to address SDGs and Disasters;
(ix) Sustainable exploitation of Marine Science and Technology
(x) Scientific data collection and management;
(xi) STI Institutional Reforms;
(xii) Multi-agency Framework, and Response Strategies;
(xiii) STEM education and Training;
(xiv) Building Next Generation STI Workforce;
(xv) STI Communication, Outreach, Advocacy and Diplomacy;
(xvi) Strategic International scientific cooperation and partnerships;
(xvii) Security for Society, and public safety.

To facilitate realization of the STI priority activities, collaborations, synergies and networking amongst key agencies will be required. In this regard, the Science, Technology, Innovation and Research Network (STIRN) has been established with NACOSTI as the secretariat. The overall aim of the network is to advance apt strategy and networking in education, training, research, commercialization, and outreach in science, technology and innovation. The network employs scientific evidence to create awareness on technological innovations/solutions, assess their impacts and advocate for the mainstreaming of such innovations and solutions into national development plans and policies. Membership of the Network is open to STI based organizations/institutions/agencies/Ministries/Departments in Kenya and will also accommodate international organizations.

A2.3 National Research Priorities

Background

The Science, Technology and Innovation Act, 2013 (Rev. 2014) mandates National Commission for Science, Technology and Innovation (NACOSTI) to set priorities in scientific, technological and innovation activities in Kenya. Accordingly, NACOSTI in consultation with stakeholders developed the National Research Priorities Framework which were informed by the prevailing Government socio-economic policies. The National Research Priorities Framework was officially launched by the Cabinet Secretary, MoE in June 2019.

Formulation of the National Research Priorities Framework also took cognizance of the Constitution, Kenya Vision 2030 and its Third Medium Term Plan, and Sector Plans. It is also anchored on international commitments including the Sustainable Development Goals (SDGs), the Science, Technology and Innovation Strategy for Africa (STISA) 2024 and the African Development Agenda 2063. The overall goal is to increase productivity, achieve sustainable economic growth, create employment, promote equity and improve the national well-being.

The following criteria was used in identifying the national research priorities:

(i) Potential impact of research in the specific field especially those addressing the Big Four Agenda and the Third Medium-Term Plan;
(ii) Addressing national needs/gaps unlikely to be met by other mechanisms of financing;
(iii) Cost effectiveness and sustainability; and
(iv) Potential for multiplier effects on the national development process.

Research institutions, universities, Ministries, Departments, and non-governmental institutions will be guided by the National Research Priorities to carry out research and generate knowledge for the economy. With the various players in the economy, working together towards a common goal, it will be possible to address the research needs of each sector.

See
https://www.nacosti.go.ke/nacosti/Docs/Information%20Centre/National%20Research%20Priorities.pdf

National R&D Priorities

The national research priority areas are:

(i) **Food and Nutrition Security;**

The access to affordable, adequate, safe and nutritious food, in sufficient quantity and quality is recognized as a basic human need to meet their dietary requirements for an active and healthy life. Low agricultural productivity, high post-harvest losses, inefficient value addition processes, poor distribution and marketing of agro-products and climate change are an impediment to this basic right. To achieve 100 percent food and nutrition security, the country will need to double agricultural production, reduce loses, enhance value addition, mitigate the effects of climate change and reverse micronutrient deficiency or hidden hunger.

(ii) **Affordable Housing;**

Kenya has an estimated annual demand of 244,000 housing units in different market segments against an estimated annual supply of less than 50,000 units. This has outpaced supply and has culminated in housing deficit over the years. Majority of Kenyans are still unable to access housing due to high cost, unfriendly mortgage regime, a rigid land tenure system and weak policy, legal and regulatory framework. The country needs to develop affordable housing programmes covering all urban centers across the country that will incorporate innovative, cost effective and efficient delivery models. These will entail the use of affordable environmentally friendly building materials, efficient construction technologies and techniques.

(iii) **Manufacturing**

The manufacturing sector is a key driver for economic growth and development through job creation and value addition. The overall goal is to increase the sector's contribution to Kenya's GDP from about 9.2% to 15%. This is constrained by high cost and unstable energy, inconsistent supply of quality raw materials, reliance on obsolete technologies, limited access to affordable credit and counterfeiting of products.

(iv) **Universal Health Coverage**

The high cost of health care, weak public health and sanitation systems, poor disease diagnosis and the emergence of infectious and non-communicable diseases present a serious impediment to the attainment of Kenya's ambition of attaining 100 percent Universal Health Coverage. Although great progress has been achieved in the roll-out of the National Hospital Insurance Fund (NHIF), the cover has been out of reach for the majority of citizens due to accessibility and cost limitations. As a hospital and not a health insurance cover, NHIF is technically limited in the extent to which the regime can assure universal health coverage.

(v) **Academic Research and Development**

Universities play a key role in the development of human resource for all production sectors of the economy through training and conducting research and development for the generation, curation and dissemination of new knowledge. University research programmes are critical in the development of theoretical foundations in basic sciences that underpin applied research. A great proportion of research funding initiatives focus more on applied research, seen to generate quick gains as opposed to basic research, whose benefits are not always apparent. The research portfolio at universities has been declining over the years due to low funding and greater focus on training.

For more details, see;
https://www.nacosti.go.ke/nacosti/Docs/Information%20Centre/National%20Research%20Priorities.pdf

National R&D Implementation Framework

The implementation framework is three (3) Tier and constitutes the National Research Steering Committee (**NARSC**), the Research Priorities Delivery Secretariat (**DS**), and Sector Working Groups/Research Consortia (**RC**). The National Research Steering Committee (NARSC) comprises the Principal Secretary responsible for Science, Technology and Innovation, the National Treasury and Principal Secretaries in state departments in charge of areas of focus in the National Research Priorities. The National Research Steering Committee (NARSC) will be convened by the Principal Secretary in charge of Science, Technology and Innovation. The Steering Committee will provide strategic direction to the Research Priorities Delivery Secretariat.

To support the National Research Steering Committee, is the Research Priorities Delivery Secretariat (DS) whose key mandate is to spearhead the implementation of the Research priorities in collaboration with relevant line ministries and other agencies in the planning and monitoring of programmes implementation by the sector working groups. The Secretariat will comprise of the National Commission for Science, Technology and Innovation, National research Fund, Kenya National Innovation Agency, Commission for University Education, State Department in charge of Research Science and Technology and Representatives appointed from the other supporting sectors and the private sector. The Secretariat will be chaired by the Director General NACOSTI. Sector Working Groups will be formed from each of the sectors aligned to the research priority areas and will coordinate the respective sector initiatives including, resource mobilization, capacity development and monitoring of progress. Each sector will identify a lead agency to chair their Sector Working Group. The National Research Fund (NRF) will take lead role in mobilization of financial resources for research. The NRF will align the funding of research programmes to the national research priorities. In addition, sector aligned public agencies will mobilize resources through the Medium-Term

Expenditure Framework in their respective MTEF Sector Working Groups. The sectors will also establish collaborations with private sector investors and other partners to mobilize additional funding. In implementing these research priorities, stakeholders are expected to mainstream appropriate financing models, environmental sustainability, climate smart initiative, national values and devolution considerations.