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THE NATIONAL TREASURY AND PLANNING

STATE DEPARTMENT FOR PLANNING

SCIENCE, TECHNOLOGY AND INNOVATIONS ECOSYSTEM IN KENYA

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ACRONYMS AND ABBREVIATIONS

ACA	Anti-Counterfeit Agency
ASADI	African Science Academies Development Institute
ASTIII	Africa Science Technology and Innovation Indicators Initiative
AU	African Union
CMF	Common Manufacturing Facility
EPC	Engineering, Procurement and Construction
GDP	Gross Domestic Product
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
ICT	Information and Communications Technology
IP	Intellectual Property
ISTI	Infrastructure, Science Technology and Innovation
KALRO	Kenya Agriculture and Livestock Research Institute
KASNEB	Kenya Accountants and Secretaries National Examination Board
KATTI	Kenya Association of Technical Training Institutes
KEBS	Kenya Bureau of Standards
KECOBO	Kenya Copyright Board
KEMRI	Kenya Medical Research Institute
KENIA	Kenya National Innovation Agency
KIPI	Kenya Industrial Properties Institute
KIPPRA	Kenya Institute for Public Policy and Research Analysis
KIRDI	Kenya Industrial Research and Development Institute
KNBS	Kenya National Bureau of Statistics
KNEC	Kenya National Examination Council
KOEE	Kenya Organization of Environmental Education
KUCCPS	Kenya University and Colleges Central Placement Service
LIWA	Linkage for Industry with Academia
MDAs	Ministries, Departments and Agencies

MSMEs	Micro, Small and Medium Enterprises
MTP	Medium Term Plan
NACOSTI	National Commission for Science, Technology and Innovations
NEPAD	New Partnership for Africa Development
NIMES	National Integrated Monitoring and Evaluation System
NSS	National Statistical Systems
OECD	Organization for Economic Cooperation and Development
R&D	Research and Development
RVIST	Rift Valley Institute for Science and Technology
SDGS	Sustainable Development Goals
ST&I	Science, Technology and Innovations
STISA	Science, Technology and Innovation Strategy for Africa
TMEA	Trademarks East Africa
TVET	Technical and Vocational Education Training
UN	United Nations
UNICEF	United Nations Children's Fund
VDS	Vision Delivery Secretariat

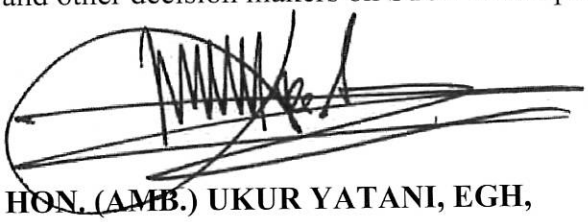
FOREWORD

The role of Science, Technology and Innovation (ST&I) is key in industrialization, economic growth and sustainable development of any country. The effective management of ST&I is now widely recognized as a determinant of both private and public sector competitiveness. Subsequently, the capacity of a country to compete in the global market is highly dependent on its ability to spur and manage ST&I and particularly the application of relevant technologies to its industries and productive sectors.

In Kenya, ST&I is one of the key foundations/enablers for national socio-economic transformations. The Kenya Vision 2030 and its subsequent Medium Term Plans, including the Third Medium Term Plan-MTP III (2018-2022), whose theme is *Transforming Lives: Advancing socio-economic development through the "Big Four"*, identified ST&I as a crucial component in both the economic and social development. The Government has prioritized Research and Development (R&D) for the generation of new knowledge and technologies that could spur economic growth and accelerate the use of applied technology in all sectors. The sector will also drive the transformation agenda by supporting the "Big Four" initiatives by ensuring that all sectors have access to new technologies in order to increase productivity and efficiency.

It is against this backdrop that the National Treasury and Planning through the State Department for Planning embarked on this study to look into the factors that surround the entire ST&I Ecosystem. The study focused on the following issues: Policy and regulatory framework for ST&I in the country; Institutional framework and linkages to ST&I in the country; Linkages between players in the ST&I sector (i.e. Government, Industry and Academia); Universal Innovation Models that Kenya can benchmark on; Indicators for innovation activities in Kenya and major challenges of ST&I indicators in the country. This is to ensure that the potential of ST&I in the country is optimized in achievement of national goals and aspirations.

We hope that this publication will serve as a vital reference for key stakeholders, including Public Policy Practitioners, Development Partners, Civil Society, Academia, Private Sector and other decision makers on ST&I development in Kenya.



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1. PREAMBLE

Science, Technology and Innovations (ST&I) plays a pivotal role in industrialization, economic growth and sustainable development of any country. The effective management of ST&I is now widely recognized as a determinant of both private and public-sector competitiveness globally. Subsequently, the capacity of a country to compete in the global market is highly dependent on its ability to spur and manage ST&I and particularly how it applies relevant technologies to its industries and productive sectors.

The Kenya's Vision 2030 seeks a similar transformation of the economy as espoused in the overall goal: "Transform Kenya into a newly industrializing, middle income country providing high quality of life to all its citizens by the year 2030 in a clean and secure environment". The Vision is anchored on three pillars (Economic, Social and Political) together with a set of foundations or enablers that include ST&I. Development and nurturing of ST&I is therefore a key determinant of the possibility of achieving the envisaged socio-economic transformation. Achieving the "Big Four" Agenda is largely dependent upon application of innovation for purposes of: increasing the contribution of manufacturing sector to 15 percent of GDP; development of affordable housing units; extending universal health coverage and achieving food security and nutrition for all Kenyans.

Kenya is a signatory to regional and global development initiatives, which pay attention to the role of ST&I in transformation of economies. The Sustainable Development Goals (SDGs) or Agenda 2030 of the United Nations (UN) specifically SDG nine (9) calls for increased investment in science and technology, with an objective of generating innovations (goods and services) that can overcome economic and environmental challenges. Further, the United Nations Economic and Social Council (ECOSOC) is the central platform for fostering debate and innovative thinking, forging consensus on ways forward, and coordinating efforts to achieve internationally agreed goals. Agenda 2063 by the African Union commits to promote Science, Technology, Research and Innovation to improve the human capital of especially young people for purposes of spurring innovation-based entrepreneurship and job creation.

Therefore, under whichever development commitment, Kenya is obligated to improve the management of the ST&I process and environment for effective and efficient delivery of new goods and services. It is against this background that the Infrastructure, Science, Technology and Innovations (ISTI) Directorate in the State Department for Planning under the National Treasury and Planning has developed this ST&I Ecosystem document. The main objective is

to document the ST&I framework, structures and processes to inform policy formulation, strategies in the ST&I sector and interventions that will accelerate commercialization of innovations. The specific objectives are as stated below:

i) Documenting a harmonized overview of the ST&I environment in Kenya;
ii) Reviewing the policy, legal and institutional framework for ST&I;
iii) Illustrating the institutional linkages for ST&I in Kenya;
iv) Documenting the innovation process/model for Kenya;
v) Reviewing potential indicators for ST&I activity in Kenya;
vi) Compiling innovations and ST&I enterprises in Kenya; and
vii) Identifying potential drawbacks to innovation development and commercialization.

This document is organized into six sections namely: Policy, Legal and institutional Framework within which ST&I is anchored; institutional support for ST&I and linkages; an overview of the innovation model in Kenya; indicators of innovations; inventory of innovations in Kenya and lastly the challenges/gaps in the ST&I sector in Kenya. The Annex of this document provides a list of the institutions dealing with ST&I in Kenya, inventory of innovations in Kenya, list of ST&I annual events, Science and Technology parks in Kenya, a questionnaire for data collection and proposed roadmap for completing the documentation of ST&I in Kenya.

2. POLICY, LEGAL AND REGULATORY FRAMEWORK

Science, Technology and Innovation activity can only thrive in an environment where the governance structures are in agreement and reflect the intended direction of activities in the country. This section reviews the legal, policy and regulatory frameworks that govern ST&I development in Kenya, with the objective of pointing out the potential gaps and recommending necessary action by concerned agencies.

i) The Kenya Vision 2030

The Kenya Vision 2030 is Kenya's long-term development blueprint that seeks to ensure that the country attains middle income status and a globally competitive economy by the year 2030. The Vision recognizes the critical role played by Research and Development (R&D) and Innovation in accelerating economic development in the newly industrializing countries. ST&I is one of the foundations for socio-economic transformation in the Kenya Vision 2030 hence the importance that the government places on it in the overall development of the Kenyan economy. The MTP sector plan on ST&I also highlights key policies, plans and projects to develop ST&I as a key foundation on the realization of the Vision 2030.

ii) Policy Framework for Science, Technology and Innovation

This framework was developed in 2012 by the then Ministry of Higher Education, Science and Technology. It recognizes that effective leveraging of science, technology and innovation is essential for wealth creation in the country. Science, technology and innovation is also a key component of social integration, sustainable development and poverty eradication based on equity, freedom, justice, governance, peace and prosperity.

iii) The Constitution of Kenya, 2010

Chapter 2 article 11 section (2) and section (3) state that: The State shall **recognize the role of science and indigenous technologies** in the development of the nation; Chapter (4) article (40) section (5) on intellectual property rights states that: the State shall support, promote and protect the intellectual property rights of the people of Kenya.

iv) The Copyright Act

In view of the provisions of the Constitution, the Copyright Act (2001) amended 2014 gives conditions under which copyright materials shall be protected by the law. The process of copyrighting publications and artistic novelties is also well covered in the Act.

v) The Science, Technology and Innovation Act, 2013

The Science, Technology and Innovation Act came into effect in January 2013. The Act's objective is to facilitate the promotion, coordination and regulation of the progress of Science, Technology and Innovation in the country. The Act established three complementary institutions to support ST&I activities in Kenya. These are: The National Commission for Science, Technology and Innovation (NACOSTI); The National Research Fund (NRF) and the Kenya National Innovation Agency (KENIA).

The process of arriving at this new law concretized in 2009 with the conclusion of the Science, Technology and Innovation (ST&I) Policy and Strategy. The ST&I Policy and Strategy provided the framework for creating a knowledge-based economy. The Policy underscored the importance of mainstreaming Science, Technology and Innovation in all sectors of the economy to ensure that Kenyans benefit from the acquisition and utilization of available ST&I capacities and capabilities to improve their quality of life.

vi) Sustainable Development Goals

The Sustainable Development Goals (SDGs), also referred to as the Agenda 2030, are a universal set of goals, targets and indicators that UN member states will be expected to use to frame their agendas and policies over a period of 15 years from the day they were adopted in September 2015.

As requested by the General Assembly resolution 70/1 on the 2030 Agenda for Sustainable Development, the President of the UN Economic and Social Council-ECOSOC will convene the meetings of the ST&I forum once a year to discuss Science, Technology and Innovation Cooperation around thematic areas for the implementation of the Sustainable Development Goals.

vii) The African Union Agenda 2063

The AU Agenda 2063 is a strategic framework for the socio-economic transformation of the African continent over the next 50 years. It builds on, and seeks to accelerate the implementation of past and existing continental initiatives for growth and sustainable development. The Agenda is underpinned by science, technology and innovation as multi-function tools and enablers for achieving continental development goals. The Agenda calls for the diversification of sources of growth and sustenance of Africa's current economic performance, and in the long-run, lifting large sections of Africa's population out of poverty. The strategy further fosters social transformation and economic competitiveness, through

human capital development, innovation, value addition, industrialization and entrepreneurship. The commitment under Agenda 2063 for the first 10 years includes the Science, Technology and Innovation Strategy for Africa (STISA-2024) which seeks to achieve an innovation-led and knowledge-based production. This will be done by improving the ST&I infrastructure as well as implementing ST&I policies.

viii) The Science, Technology and Innovation Strategy for Africa 2024 (STISA-2024)

The strategy was developed In June 2014 during the 23rd Ordinary Session of African Union Heads of State and Government Summit. It refers to a 10-year Science, Technology and Innovation Strategy for Africa (STISA-2024) that was adopted as part of the long-term people centered AU development Agenda 2063. On the Wings of Innovation, the AU Science, Technology and Innovation Strategy for Africa 2024 (STISA-2024) places science, technology and innovation at the epicenter of Africa's socio-economic development and growth.

The strategy further defines four mutually reinforcing pillars which are prerequisite conditions for its success. They are:

1. Building and/or upgrading research infrastructure;
2. Enhancing professional and technical competencies;
3. Promoting entrepreneurship and innovation; and
4. Providing an enabling environment for ST&I development in the African continent.

Continental, regional and national programmes will be designed, implemented and synchronized to ensure that their strategic orientations and pillars are mutually reinforcing, and achieve the envisaged developmental impact as effectively as possible.

ix) African Science Technology and Innovation Indicators (ASTII) Initiative

The New Partnership for Africa's Development runs the ASTII programme for enhancing African Countries capacity to develop and utilize ST&I for advancement of their economies. Specifically, the programme extended technical assistance in assessing the progress made in either implementation of ST&I policies or output from ST&I investments across the participants. Subsequently the outcomes of this programme include increased funding of ST&I activities to approach one (1) per cent of the GDP. It is clear that Kenya has not met this requirement, despite a marked increase in the financial resources extended to the sector.

3. INSITUTIONAL FRAMEWORK AND LINKAGES FOR ST&I IN KENYA

There are several institutions that directly or indirectly support ST&I in Kenya. These can be classified according to their roles in ST&I activities as follows:

i) Governance of ST&I

The institutions in this category include:

The Ministry of Education which has the coordinative role of ST&I in the government, as well as the supervisory role over policies and programmes in the sector. Other Departments and Agencies report to the Cabinet through the Ministry.

The National Commission for Science Technology Innovation (NACOSTI) which was founded through the Science, Technology and Innovation Act of 2013. The role of NACOSTI is regulation and quality assurance in ST&I sector with an objective of advising the Government on related matters.

The National Research Fund also established by the ST&I Act of 2013, is responsible for mobilization and allocation of resources for research and innovation as well as creating linkages with potential partners in the sector.

The Kenya National Innovation Agency's (KENIA) main mandate is development and management of the innovation system in Kenya, through fostering utilization of knowledge through entrepreneurship. It was also established by the ST&I Act of 2013.

ii) Education and Research Institutions

This category constitutes Universities, Technical and Vocational Education Training (TVET) institutions; research institutes; schools and other educational networks. These institutions form one source of innovation ideas and activities in Kenya, or even assist in improvement and refinement of ideas that come from the business world into more effective products.

There are also intermediary institutions that seek to link the participants in education and industry sectors. **The Linking Industry with Academia (LIWA)** is one such interest group. Others are academies of sciences and professional associations.

iii) Regulatory Authorities

Before an innovation is commercialized, it has to conform to all the regulations concerning its marketing, use and trading. These institutions regulate: quality (Kenya Bureau of Standards and the Information Communication Technology Authority); environmental impacts (National Environment Management Authority); accreditation (Kenya Accreditation Service); Intellectual Property Rights (Kenya Industry Property Institute and Anti-Counterfeit Agency) among others. Regulatory authorities form an important source of data for innovation activities in Kenya.

iv) Business Environment

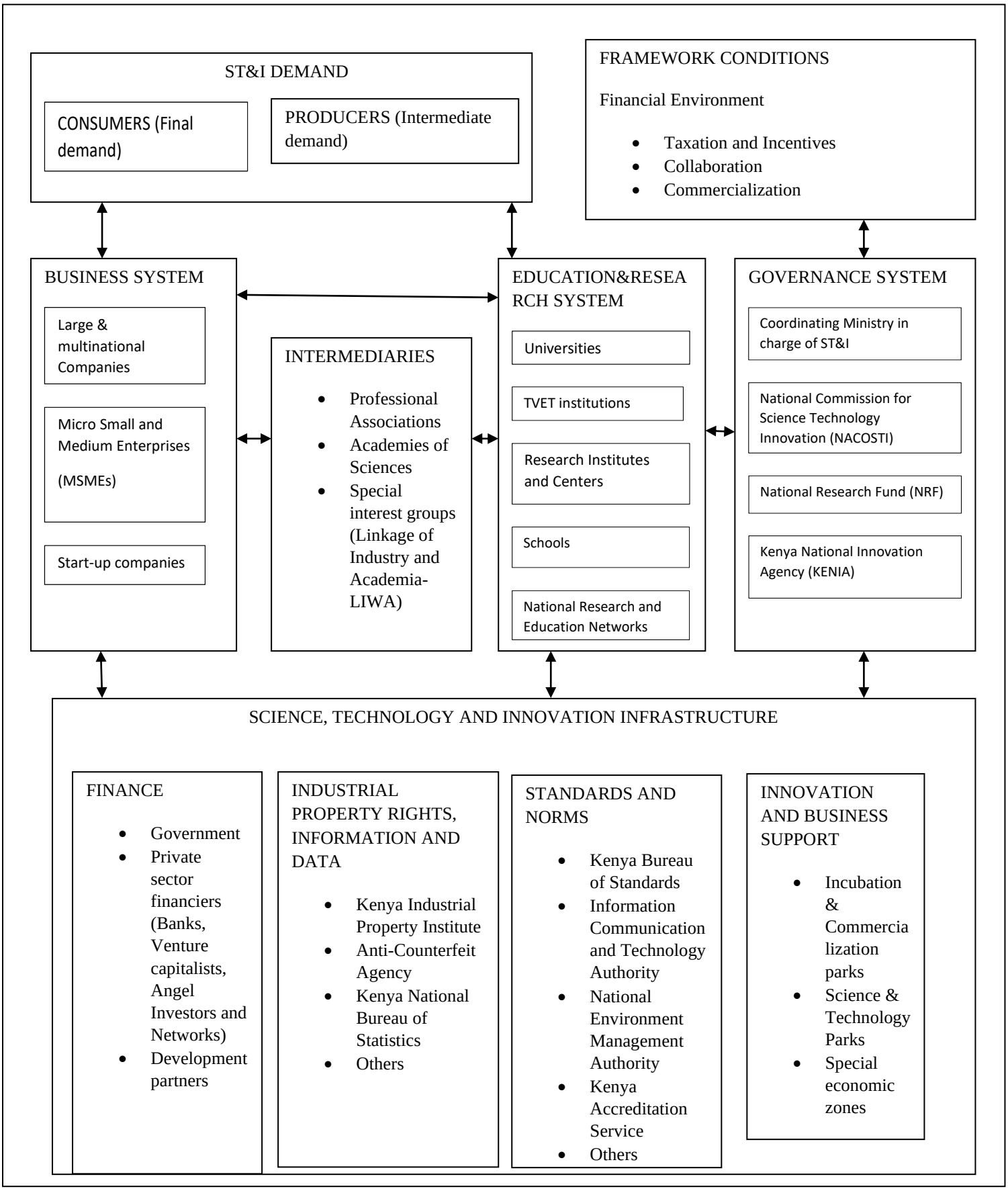
The business environment ranging from multinational and local large companies; Micro, Small and Medium Enterprises (MSMEs) and small start-up companies are also sources of innovation concepts. The latter comes from identification of gaps in consumer demand, which presents entrepreneurial opportunities. Kenya ranks poorly in the Human Capital and Research elements of the Global Innovation Index, implying that the business world could be contributing significantly to the innovation portfolio in Kenya. This is a potential area of investigation, since no data exists on the sources of original and successfully commercialized innovations in Kenya.

Another category of business institutions necessary for the ST&I sector are financial institutions such as banks; venture capitalist; Angel investors and network as well as development partners who are important in financing of the activity leading up to the commercialization of innovations.

The business world in partnership with the Government also provides innovation and business support for the innovators that want to commercialize their own innovations. Kenya has several incubation and commercialization centers; science and technology parks as well as proposed special economic zones that form part of the Vision 2030 projects.

The potential complex linkages between the supportive institution for ST&I in Kenya are illustrated in figure 1 below. There has not been a quantification of the required or existing level of complementarity between these institutions, although it has been acknowledged by the ST&I sector players that the various actors often do not work in a harmonized manner (MTP III Sector Plan for Science Technology and Innovation)

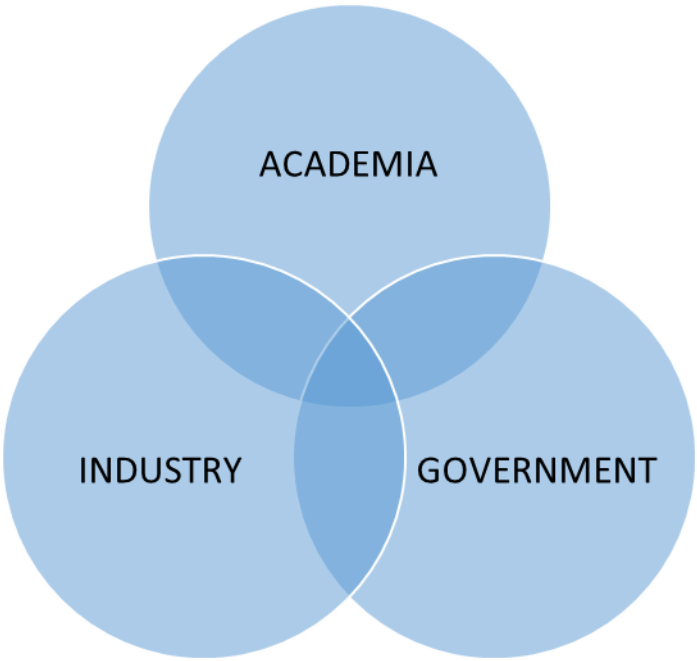
Figure 1: Institutional framework and linkages for ST&I in Kenya (Adapted from KENIA -2018)



4. THE QUADRUPLE HELIX CONCEPT

The core premise of innovation ecosystems is robust linkages between government, universities (Academia), and industry: with the interplay between these three institutional spheres forming the crux of the well-established Triple Helix Innovation Model (Etzkowitz and Leydesdorff, 2000). However, in recent years, the effectiveness of this model has been questioned, as regions have failed to meet expected levels of innovation, GDP development, and employment (Asheim and Coenen, 2005; McAdam et al., 2012). Indeed, under the guise of the Triple Helix Model, knowledge flows were said to be bidirectional in nature which contrasts with the need for more co-creational engagement expected from regional innovation policy (Arnkil et al., 2010).

Figure 2: The Triple Helix Framework



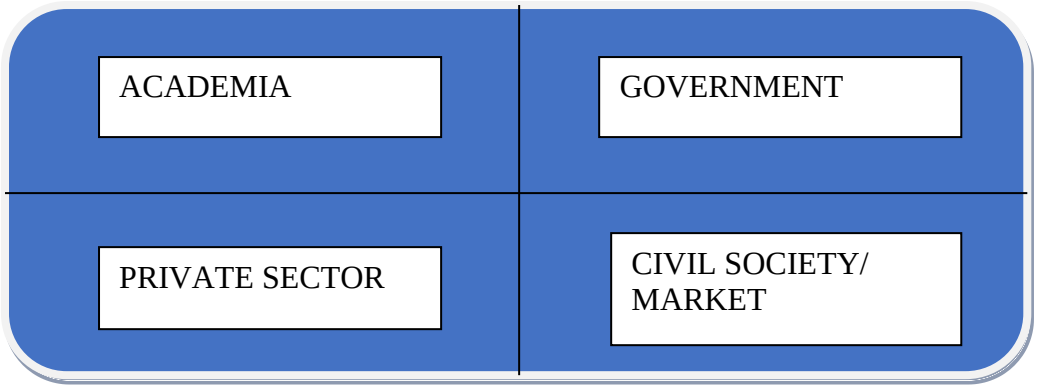
Source: ***Etzkowitz and Leydesdorff, 2000***

In order to address these challenges, recent policy initiatives such as Smart specialization have identified the need for more open and co-creational innovation processes involving societal-based innovation user stakeholders, in addition to those of the Triple Helix, leading to the emergence of the Quadruple Helix Innovation Model (Kim et al., 2011; Carayannis, 2012; Leydesdorff, 2013; Plewa et al., 2013).

The inclusion of the fourth helix depicting societal based innovation users (Leydesdorff, 2013; Carayannis et al., 2012) and the subsequent emergence of quadruple helix structures reflects the increasing importance placed on public valued or societal led innovation

(Bozeman et al., 2015). This development is consistent with that of 'open' innovation models (Chesbrough and Garman, 2009) which have coevolved as a result of negotiation and collaboration between stakeholders in a bid to enhance regional innovation.

Figure 3: The Quadruple Helix Model



5. INNOVATION MODELS IN KENYA

There are a number of models that explain the process of innovation. The main ones are: Linear model and Chain-link model. The Product Cycle Model and the Common Manufacturing Models are processes that explain the processes of individual organizations in their day to day activities. Each of these model is explained below.

5.1 Linear Model of Innovation

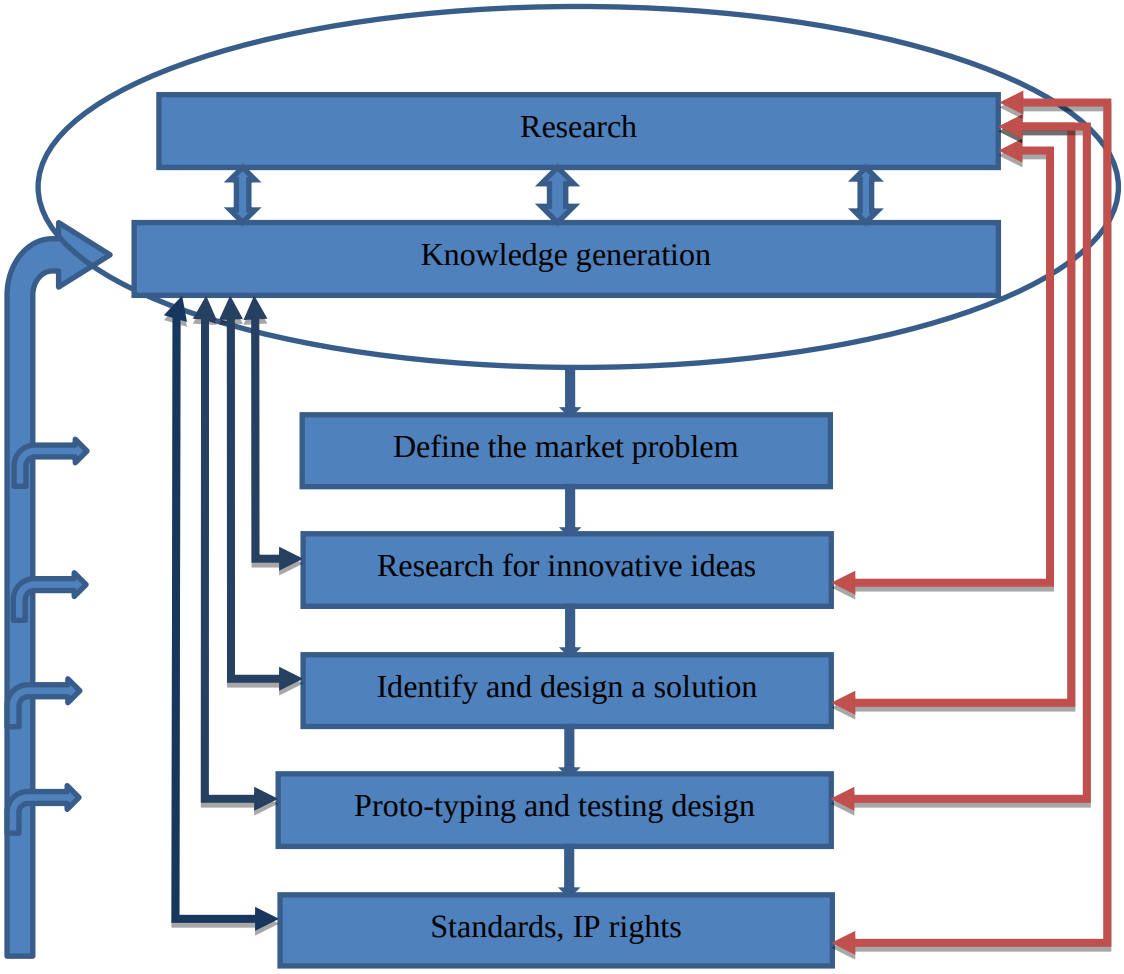
The Linear Model (technology vs. demand push) and the coupled or Chain Link Model diagram attempt to explain the innovation process (see Shavinina, 2003). This model assumes that all innovations result from both research and development (R&D) technological breakthroughs (technology-push), or from unmet market needs (need-pull) such as process re-engineering.

5.2 Chain-Link Model of Innovation

The second model acknowledges that innovations can result from several sources or simultaneously from both market and technological processes. This model is more likely to explain innovations in Kenya, since they tend to come from both R&D (largely carried out by Universities and Research institutions) and unfulfilled market needs (which are usually identified by those pursuing interests in the business world) or even a combination of the two processes. The chain link model describes an interactive process, which is a more reasonable assumption for Kenya. It is important to notice that these assumptions need validation using data from the field that is currently not available.

Significant emphasis is given to the commercialization process in Kenya with a vivid description of the options that an innovator has with regard to taking his innovations to the market. The details of these options are explained below. An important point to note here is that data for innovators who have gone through the entire journey of innovation and eventually commercializing their innovations is currently not available, and this is a second potential area for research.

Figure 4: Illustration of the Chain-Link Model of Innovation

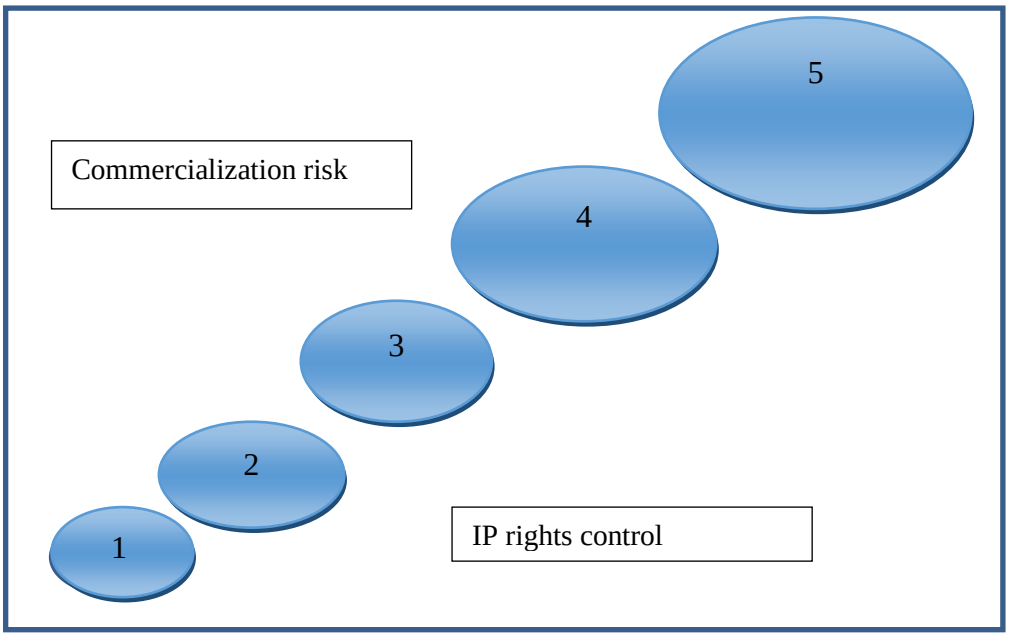


5.2.1 Commercialization Risk and Intellectual property Rights

Commercialization is the process that converts ideas, research, or prototypes into viable products and production systems that retain the desired functionality, while designing them to be readily manufactured at low cost and launched or implemented quickly with high quality designed in. By linking the front end and commercialization opportunities, uncertainties and risks related to commercialization are taken into consideration already at the early stages of innovation development where most of the important decisions related to the performance features, market attractiveness and costs of the new innovation are done and fixed.

Intellectual Property (IP) rights refer to the general term for the assignment of property rights through patents, copyrights and trademarks. These property rights allow the holder to exercise a monopoly on the use of the item for a specified period.

Figure 5: The link between the commercialization risk and corresponding IP rights.



Source: Adopted from Kline and Rosenberg (1986) and World Intellectual Property Organization (WIPO)

Figure 5 illustrates the link between commercialization risk and and corresponding IP rights control.

The stages of the model are best explained by the Table 1.

Table 1: Stages, Inputs, Process, Players and Outputs and Consumers

Stages		Sources/Players/ Consumers	Stage
1.	Market Need identification	Innovator Market	Inputs
2.	Idea Generation	Innovator Research	Inputs
3.	Idea Selection Methods	Research Innovator	Inputs
4.	Standards, specifications	Statutory/Regulatory bodies	Inputs
5.	Business plan	Research Innovator Market	Inputs
6.	Prototype development	Hardware Incubators Firms Innovators	Throughputs
7.	IP rights	IP Administrators, KECOBO, KIPI, ARIPO	Throughputs

Potential model applications and modifications

The model can be applied in process, products, services, market, and organizations innovations.

Commercialization Options of the Model

The Model has an inbuilt commercialization process. There is need for support at the business model validation. The link between commercialization and property rights is explained below (see figure 5).

i. Outright Sale of Intellectual Property (IP)

The innovator sells the Intellectual Property Right to an entrepreneur, who then gets exclusive ownership and control of IP rights. The advantage to the innovator is that very low investment is required, and the level of risk is lowest. The downside is the total loss of Intellectual Property Rights, and its future possible earning for the innovator

ii. Licensing the Intellectual Property to a Third Party

This option involves contractual agreements between the IP owner and third parties for the exploitation of the innovation. The contractual licensing controls: duration; space/locality; the market or even the application of the IP rights. This means that the innovator still retains an aspect of IP control, while having two advantages of: exploring new markets, popularization of the product/service while getting revenue for IP rights from the contracted parties. All this is at a moderate demand for investment and risk.

iii. Joint Venture

The innovator looks for some level of capital for investment as well as a partner who also brings on board some capital, based on contractual terms. The focus here is on increasing the profits from the sale of products emanating from the IP. The advantage is moderate risk and level of investment required. There is also an advantage of the moderate control over the IP than in the case of complete sale of IP.

iv. Strategic Alliances

The innovator looks for a fellow innovator or technology owner and makes the investment that operates on the combined IPs which is expected to generate revenue for the business. The objective is to improve the innovation while generating income from the combined sets. The value of each partner's IP must be determined at first and its contribution. There is higher risk from the investment and the control of IP is also higher and determined by the licensing agreements.

v. Internal Development

This is a purely 'go it alone' commercialization model where the innovator takes up the highest commercialization risk, and also retains all the IP rights within his control. Enforcement of IP rights is easiest in this model, but other issues like financing and market access are potential problems that the innovator must anticipate and address.

The verification of the aspects of this model with respect to innovation process in Kenya will be done though primary research, a role that will be extended to the Kenya Institute for Public Policy Research and Analysis (KIPPRA) and other research institutes in the country. Data from innovators will be collected to give an insight of the typical journey of an innovator in Kenya. The database of innovators under development by the Kenya Innovation Agency (KENIA) forms the primary sample for this future research.

5.3 Product Cycle Model

Stages for the product cycle model

i. *Precursors stage (Bleeding edge)* – At this stage an idea/concept exists but yet to result in invention.

Inputs: Research- Desk top research, market research; Quantification of potential demand of the product; Transport costs; Research costs; Advertisement; Industrial Property; Finance; Business environment- Policy and regulatory environment, market demand, competition; Research and development

Players: Government; Competitors; Financial Options-Development partners, financial institutions etc.

Output: Prototype; New ideas/knowledge

Consumers: Technology enthusiasts:

ii. *Invention Stage (Leading Edge)* - Likened to birth after an extended period of labour. Curiosity, scientific skills, determination and showmanship to create a new technology that proves itself in the market place. It is too new to find a person to take it up. This is a very expensive stage as it involves a lot of expenses.

Inputs: Finances; Labour; Production facility; Utilities; Meteorology and standards; Research and development

Players: Financiers; KEBS, KIPI; Government

Output: Licensing-Trade, business etc.; Product/Service; Trademark/ copyright; New ideas/knowledge

Consumers: Target market; Government

iii. *Market Introduction Stage*-Also known as commercialization stage. Involves high cost and high prices. A product at this stage is relatively expensive because of high cost of inputs.

Inputs: Finances; Market survey; Personnel; Consultations/advisory services; Contractual agreements; Research and development

Players: EPC/Chamber of Commerce/Jua Kali Association; Lawyers; Government; Competitors; Financiers

Outputs: Signed contracts; Market intelligence report; Distribution networks; Sales; New ideas/knowledge

Consumers: Government; Franchisees

iv. *Growth stage*-The product is acceptable in the market. Costs are reduced due to economies of scale, increased sales, profits being realized, market niche being created and expansion of production and distribution.

Inputs: Personnel; Infrastructure; Finances; Business Networks; Permits/licences; Research and development

Players: Financiers; Government; Distributors; Competitors; Consumers

Outputs: Sales; Employment opportunities; New markets; Business networks; New ideas/knowledge.

Consumers: Government; Target market

v. *Maturity Stage*- The costs are very low. Prices drop as a result of competition from other products. Larger margin of Profits realized as the product becomes accepted.

Inputs: Personnel; Infrastructure; Finances; Business Networks; Permits/ licenses; Research and development.

Players: Financiers; Government; Distributors; Competitors; Consumers

Outputs: Restructuring/diversification; Competition

Consumers: Government; End users

vi. *Decline stage* - The product begins to fade from the market, decline in sales, profits reduce substantially, increased competition. Succession plans for the product should be conceptualized at this stage.

Input: Finances; Experts; Consultants

Players: Financiers; Government; Private sector

Output: Closure; Retrenchment; shrinking market

Commercialization Options – Stage 3 – Market Entry

Sustainability – Stage 4 - Growth Stage

5.3 Common Manufacturing Facility Innovation Model

Common Manufacturing Facility Concept is based on:

- ✓ Common space
- ✓ Pooled personnel
- ✓ Common infrastructure
- ✓ Common and abundant resources

Examples of Existing Common Manufacturing Facilities

- ✓ Slaughterhouse
- ✓ Regorego (posho mill)
- ✓ Producer Co-operatives
- ✓ KIRDI Model

Figure 6: CMF Innovation Process Model

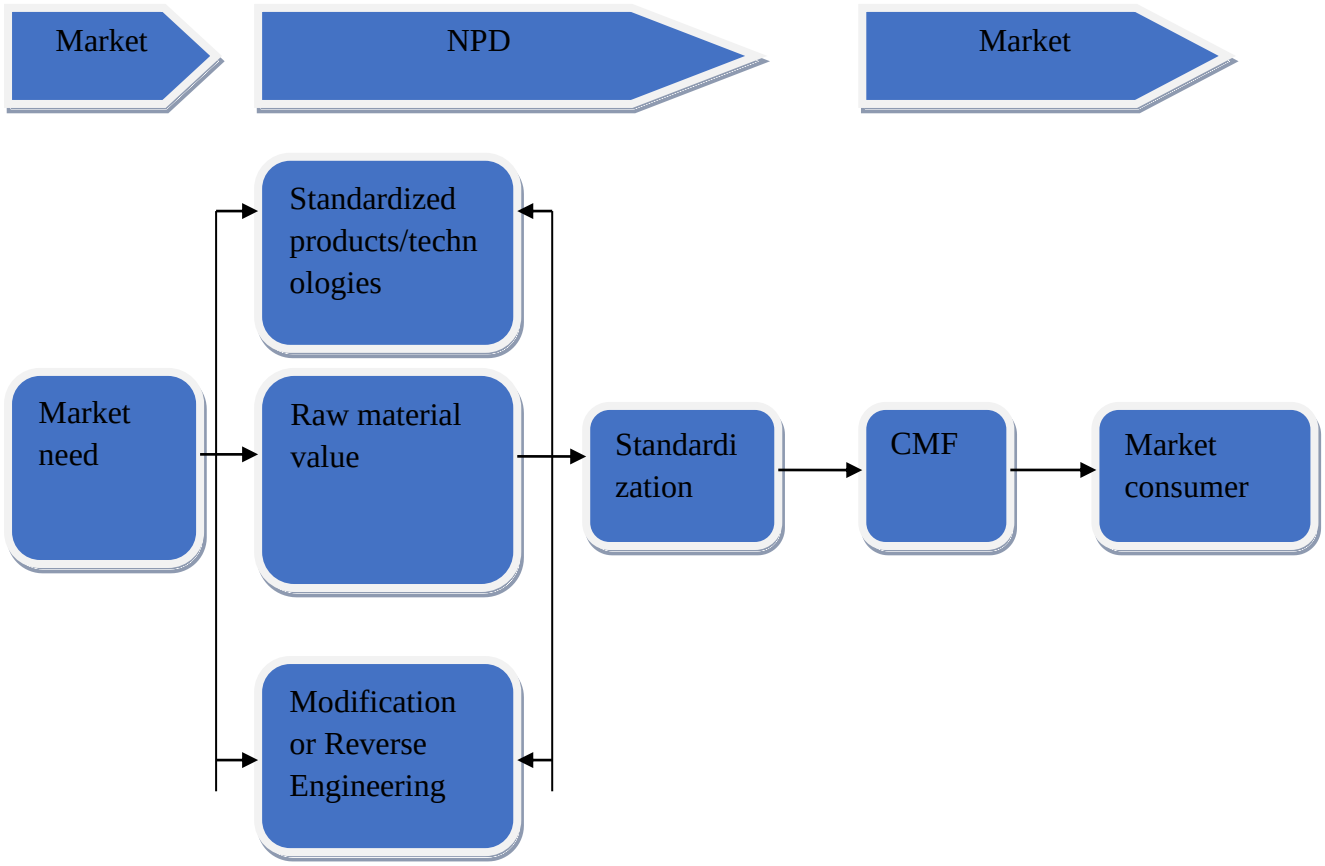
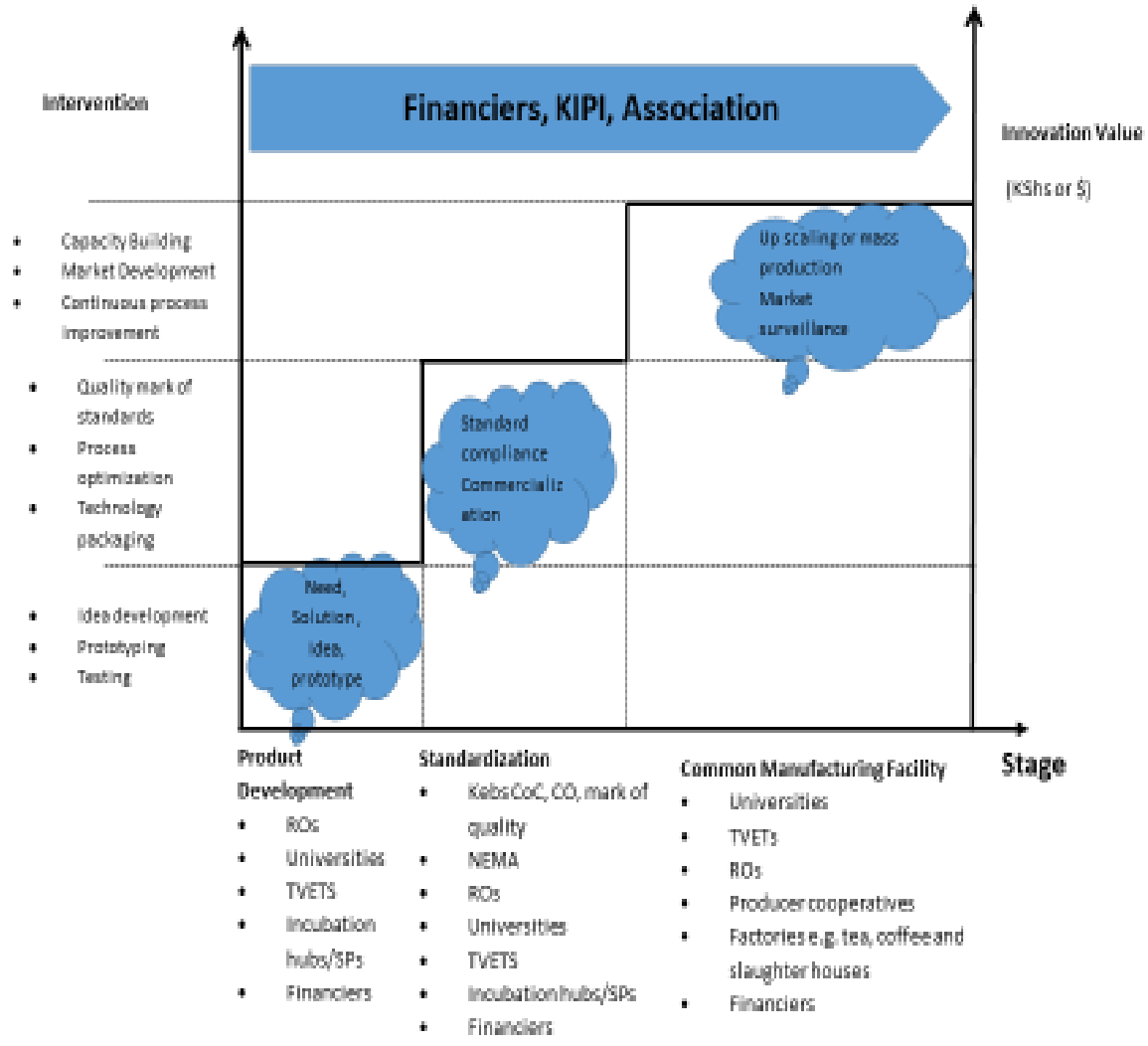


Figure 7: CMF Innovation Enabled Ecosystem/Value Chain



Innovation Enabled Ecosystem/value chain

The following were noted:

- ✓ Gaps – Lack of studies on the model
- ✓ Commercialization – Product dependent, therefore, options are not limited
- ✓ Uptake – Easily amenable with Kenyan culture
- ✓ Applications – Applicable across many business including e.g. shop stalls, chama
- ✓ Sustainability – Proven concept / Continuous process/improvement

Role of CMF in the Big Four Agenda

- ✓ Manufacturing – Value addition and increasing exports
- ✓ Food Security – Post Harvest Technology
- ✓ Health – Nutriceuticals

Common Manufacturing Facility (Products)

Common User Facility (Services and Products)

Innovation Model for Kenya

There is need for an appropriate model that best explains innovation process in Kenya. This model would combine the features of the above named models and localize it to the Kenyan context.

6. INDICATORS FOR INNOVATION ACTIVITY IN KENYA

While science and technology performance has for long been tracked and indicators are readily available, innovation has a fuzzy definition and there has been controversy regarding how to measure it. The Africa Science Technology Indicators Initiative by the New Partnership for Africa Development attempted to resolve this issue for the sake of tracking performance in Africa's ST&I sector. This is due to the realization that Africa's economy has to depend heavily on ST&I to meet most of the targeted goals. Two major surveys in Kenya were undertaken by the Ministry of Education in partnership with the Kenya National Bureau of Statistics (KNBS) in the years 2012 and 2015. The first was generally intended to identify the nature of innovation activity in Kenya, while the second focused on picking relevant indicators for the sector based on information from 700 firms. The definition of innovation in the two reports follows that of OECD/Eurostat (2005) which describes innovation as 'a new or significantly improved product (good or service), process, marketing method or organizational method in business practices, workplace organization or external relations that has been implemented.'

The important points for consideration in choice of indicators of ST&I include:

- They should enable one to determine factors for innovation;
- Measurements should go beyond targets and aggregates to an analysis level that will help understand why and how innovation happens in firms;
- The measurement system should address the role of government, including central and local government and various agencies, in fostering innovation;
- Indictors of ST&I must capture knowledge interactions; and
- Give a signal regarding the impact of ST&I on well-being and its contributions to achieving social goals

A major shortcoming of these indicators is that they were generated from a sample of enterprises that had a minimum of ten (10) employees and may not be a true reflection of all the existing indicators. Further work may therefore be necessary to identify more indicators, with smaller startup units in mind. The extract of the identified indicators of ST&I is presented in table 2.

6.1 Major challenges of ST&I indicators in Kenya

The strategies need to allocate top priority to overcoming obstacles to effective ST&I monitoring and evaluation in Kenya. The challenges are: Weak institutional arrangement

dedicated to ST&I Monitoring and Evaluation as well as coordination and the limited degree of agreement among concerned institutions, on common definitions for even some of the main entities addressed in ST&I performance evaluation.

ST&I Indicator classification

ST&I Indicators can be grouped into two main categories.

- Those that address ST&I human resources and related development activities such as the number of researchers, education, and training activities to enhance their effectiveness
- Those designed to appraise R&D activity, including national expenditure on R&D, output produced by national R&D institutions and the effectiveness of linkages between such institutions.

ST&I Indicators can also be classified according to their position within the national STI system as indicators of inputs, outputs or processes and impact.

- **Input indicators:** number of researchers and financial expenditure on R&D
- **Output indicators:** number of patents and published papers
- **Impact indicators:** revenue generated by high technology enterprise or exports of high technology products in comparison to total exports

6.2 Identification of ST&I Indicators in Kenya

The process involves answering the questions: Who are the major players in ST&I? How many programmes: programme objectives/goals, associated programme outcomes? What are the sub programmes under each programme, what are the key outputs under each sub-programme?

In the National reporting indicator handbook for MTP II, there were no ST&I indicators (output or outcome). There is need to identify some for MTP III. Some indicators have been developed by MED as shown in table 2 below.

Table 2: Proposed ST&I Indicators in MTP III

Performance indicator	Unit of Measure	Baseline 2016/17	Mid-term Projection 2020	End-term Projection 2022
Share of Research and Development as % of GDP[i]	%	0.79	1.4	2
Global Competitiveness Index [ii](Ranking)	No	91	88	85
Innovation Sophistication Index [iii](Ranking)	No	41	38	36
Higher Education and Training Index[iv](Ranking)	No	97	94	92
Technological Readiness Index[v](Ranking)	No	88	85	83

There are a number of existing ST&I indicators in the world which can be adopted to the Kenyan context. Table 3 presents the indicators.

Table 3: International Indicators on ST&I

S/No	Indicator	Definition
1.	Gross Domestic Expenditure on R&D (GERD)	GERD is total intramural expenditure on R&D performed on national territory during a given period
2.	GERD as a percentage of GDP	GERD on R&D expressed as a percentage of GDP
3.	GERD per Capita	The Gross Domestic Expenditure on R&D divided by total population
4.	Full Time Equivalent (FTE) researchers per Capita	FTE staff as a true measure of the volume of R&D. One FTE may be thought of one person-year
5.	Number of national institutions involved in R&D	All national institutions including universities and other organizations involved in R&D
6.	National/Regional prizes dedicated as incentives to researchers and inventors	The number of National/Regional prizes dedicated as incentives to researchers and inventors
7.	Publications in refereed journals	A refereed journal has a structured reviewing system in which at least two reviewers, excluding in house editors, evaluate each unsolicited manuscript and advise the editor as to acceptance or rejection
8.	Co-authorship and other ST&I cooperation with developed countries	Co-authored publications involve authors from at least two different countries
9.	Number of registered patents	Legal property right over an invention, which is granted by national patent offices
10.	Number of universities and other institutions of higher educations	The total number of national universities and institutions of higher learning
11.	Tertiary school enrolment	Ratio of the number of pupils enrolled in all post-secondary schools and institution by the population in the 18-24 age group.
12.	Number of students enrolled in ST&I fields (Bachelors, Masters and PhD)	Students currently enrolled in the natural and applied sciences, including medicine as a percentage of total enrolled students

S/No	Indicator	Definition
13.	Number of Science and Technology colleges and universities	The number of science and technology colleges that provide studies in the following fields: engineering, natural sciences, mathematics and ICT
14.	Higher education expenditure as percentage of a GDP	Total expenditure on higher education expressed as a percentage of GDP
15.	Distribution of science and technology colleges in universities by areas	The ratio of the different areas of sciences and technology colleges (basic science, computer, engineering, medicine, pharmacy, dentistry, nursing, Para medicine agriculture, veterinary science and others) in universities to the total number of science and technology colleges
16.	Number of industrial contracts concluded by sector	The number of industrial contracts concluded in the following fields: cement and glass, metallurgical, oil and gas, petrochemicals, pharmaceuticals, power, waste management and water and others
17.	Value of industrial contracts concluded by sector	The value of industrial contracts concluded in the following fields: cement and glass, metallurgical, oil and gas, petrochemicals, pharmaceuticals, power, waste management and water and others
18.	Number of infrastructure contracts concluded by sector	The number of infrastructure contracts concluded in the following fields: electrical, housing and offices, port, power, telecommunications and water
19.	Value of infrastructure contracts concluded by sector	The value of infrastructure contracts concluded in the following fields: electrical, housing and offices, port, power, telecommunications and water
20.	Employment in industry (percentage of total employment)	The industry sector includes mining and quarrying (including oil productions), manufacturing, construction, electricity, gas and water.
21.	Employment in services	Services included wholesale and retail trade, restaurants and hotels, transport, storage, communications, financing, insurance, real estate and business services, community, social and personal services.
22.	Exports of high technology	High technology exports are products with high R and D intensity. They include high technology products such as aerospace, computers pharmaceuticals, scientific instruments and electrical machinery
23.	Exports of medium technology	Automotive products, manufacturing equipment (such as agricultural., textile and food processing machinery), some forms of steel (tubes and primary forms) and chemicals products such as polymers, fertilizers and explosives
24.	Exports of low technology	Low technology exports include textiles, paper, glassware, and basic steel and iron products (such as sheets, wires and un-worked casting)
25.	Extent of process automation in the segment/sector/industry	This indicator is directly related to the one listed above but with reference to technology inputs targeting automation in particular.
26.	Investment in new process equipment	Provides numerical information on expenditure dedicated to the purchase, maintenance and servicing of processes incorporating the new technology inputs in any given sector
27.	Process improvements introduced	Presents information on the number of processes introduced that are based on new technology inputs or that utilize new technology in production or service activities in a segment or sector under consideration

7. CHALLENGES /GAPS IN THE ST&I SECTOR IN KENYA

There are several notable challenges to the ST&I sectors and particularly innovation activity in Kenya. The latest challenges according to this study, the MTP III, the Science, Technology and Innovations Sector Plan as well as in the fourth Annual Progress Report for second Medium Term Plan (MTP II) include low funding as well as lack of a policy for the sector. Other challenges specific to the innovation system are adopted from the Kenya National Innovation Agency (KENIA) as follows:

1. Inadequate funding for the sector;
2. Delayed finalization of a comprehensive national ST&I policy;
3. Lack of a specific national policy on Innovation;
4. Weak linkages in the national innovation system actors (Industry, research and academia);
5. Undocumented capability for managing innovations;
6. Low awareness of both innovation and industrial property issues (Capacity building gaps);
7. Inadequate data and information on innovation;
8. Brain drain and skills mismatch; and
9. Low rate of commercialization of innovations.

There are additional global developments that may present additional challenges to the ST&I sector in Kenya such as: globalization of IP rights and focus on sustainable development and green economy as well as climate change.

8. CONCLUSION

Science, Technology and Innovations is one of the enabling sectors for national transformation. However, the contribution of ST&I sector to the economic growth has not been evaluated and therefore not known. In addition, though ST&I plays a pivotal role in national development, the achievements of the sector have not been exhaustively documented and disseminated. The Infrastructure, Science, Technology and Innovations Directorate documented the ST&I Ecosystem to inform national and sectoral policy formulation and planning in the ST&I Sector.

The document covers a number of critical issues which include: Policy, legal and regulatory framework for ST&I, the quadruple helix model of innovations, innovation process model and indicators for ST&I among others.

The economic performance of any country is closely tied to the application of science and technology. However there are serious limitations in application of technology. This is a serious weakness in our development strategy, which requires urgent attention. In order to realize the fruits of Kenya Vision 2030, enhancing Kenya's scientific and technological capacity, inculcating scientific culture and integrating science and technology in our production and services sectors is paramount.

9. RECOMMENDATIONS

In the course of this study, several issues regarding improvement and support of the entire ST&I Ecosystem and the appropriate innovations model arose. They mainly focused on:

- Data unavailability on the innovation processes in Kenya that hinders the development of an appropriate innovations model in the country.
- Available assumptions on the universal innovations models are yet to be validated to the Kenyan context.

In this regard the following recommendations were suggested regarding ST&I in general and the appropriate ST&I model.

1. Development of a Kenya specific innovation model.
2. Finalization of the ST&I Policy to guide innovation processes in Kenya.
3. Finalization of the Industrial Property Policy to provide guidance on issues of intellectual property.
4. Increase research funding to enhance innovation in the country
5. A format to document the Database of Institutions Dealing with Science, Technology and Innovations in Kenya be developed and used for data collection.
6. Development of comprehensive indicators of ST&I in the country.
7. Provide opportunities for young innovators to engage with Government and other players in the ST&I sector to facilitate access to among others, access to training opportunities and finance; and support for commercialization.
8. Exhibitions such as Young Scientists Kenya Exhibitions should be held in all the 47 counties.
9. The sector to prioritize possible areas of research in ST&I and identify areas to venture in with specific emphasis on research areas that support the Big 4 Agenda.

REFERENCES

African Union (2014). *Science, Technology and Innovation strategy for Africa 2024 (STISA-2024)*. Addis Ababa. The African Union.

African Union Commission. (2015*). Agenda 2063: The Africa We Want: A shared strategic framework for inclusive growth and sustainable development: First ten-year implementation plan 2014–2023*. Addis Ababa. The African Union.

Asheim, B.T. and Coenen, L. (2005) Knowledge Bases and Regional Innovation Systems: Comparing Nordic Clusters. Research Policy, 34, 8, 1173–1190.

Etzkowitz, H., Leydesdorff, L. 2000. The Dynamics of Innovation: From National Systems and "Mode 2" to a Triple Helix of University-Industry-Government Relations. Research Policy 29, 109-123.

Kenya National Innovation Agency (2018) *Strategic Plan: 2018-2022*. Nairobi. KENIA

Leydesdorff, L. (2010). The Knowledge Based Economy and the Triple Helix Model. *Annual Review of Information Science and Technology*, 44(1), 365-417.

Republic of Kenya (2001) *Copy Right Act 2013*. Government Print Press

Republic of Kenya (2010) *Constitution of Kenya*. Nairobi. Government Print Press

Republic of Kenya (2008) *Kenya Vision 2030*.

Republic of Kenya (2013) *Science, Technology and Innovations Act 2013*. Government Printer

Shavinina, L. V. (Ed.). (2003). *International handbook on innovation*. Elsevier.

United Nations (2015) *Sustainable Development Goals*. United Nations.

<https://www.un.org/sustainabledevelopment/sustainable-development-goals/ >

ANNEXES

Annex 1: Institutions for ST&I and other ST&I Players in Kenya

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
MINISTRIES, DEPARTMENTS AND AGENCIES (MDAs) AND APEX BODIES					
1.	The National Treasury and Planning (State Department for Planning)	• Strengthen planning and policy formulation at all levels; • Strengthen linkages between planning, policy formulation and budgeting at all levels; • Enhance national competitiveness through regional and international economic cooperation; • Improve tracking of implementation of development policies, strategies, and programmes and projects	• Improve tracking of implementation of development policies, strategies, and programmes and projects	Public	State Department for Planning P.O. Box 30005, 00200 Nairobi, Kenya Treasury Building, Harambee Avenue Tel: +254-020-2252299 Email: info@planning.go.ke ps@planning.go.ke
2.	Ministry of Education Science and Technology	• National policies and programmes that help Kenyans access quality and affordable, school education, post-school, higher education and academic research.	• Enhance integration of Science, Technology and Innovation into national production systems for sustainable development.	Public	State Department for University Education and Research P.O. Box 9583-00200 Nairobi, Kenya Jogoo House B, Harambee Avenue Tel: +254-020-3318581 Email: info@education.go.ke ps@education.go.ke
3.	Ministry of Environment and Forestry	• Policy formulation and implementation on protecting, conserving and managing the environment and natural	• Fund innovations that focuses on agribusiness, water, energy and resource based waste management.	Public	NHIF Building 12th floor, Ragati Road, Upper Hill.

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		resources for socio-economic development			P.O. Box 30126 00100 Nairobi, Kenya Tel: +254 020 2730808/9 Email: psoffice@enviornment.go.ke
4.	Ministry of Industrialization and Enterprise Development	• Industrialization and Cooperative policy formulation and implementation; • Implementation of the Industrial Property Rights regime; • Private Sector Development Policy and Strategy; • Quality Control including Industrial Standards development • Co-operative Savings, Credit and other Financial Services Policy and regulation; • Development of Micro, Small and Medium Enterprises and Buy Kenya policy.	• Co-operative Savings, Credit and other Financial Services Policy and regulation; • Development of Micro, Small and Medium Enterprises and Buy Kenya policy.	Public	Social Security House, Block A, 17th, 23rd Floor P.O. Box 30418-00100, Nairobi, Kenya Tel: +254 20-2731531. Email: ps@industrialization.go.ke cs@industrialization.go.ke
5.	Ministry of Information and Communication Technology and Youth Affairs	• Formulation of policies and laws that regulate standards and services in the Information, Communication and Technology (ICT) sector, Telecommunications and the Media industry	• Regulates standards and services in the Technology (ICT) sector	Public	Teleposta Towers, Kenyatta Ave. Koinange Street P.O. Box 30025-00100, Nairobi Kenya Telephone: (+254) 020 4920000 / 1. E-Mail: info@information.go.ke
6.	Ministry of Agriculture, Livestock and Fisheries	• Formulation, implementation and monitoring of agricultural legislations, regulations and policies • supporting agricultural research and promoting technology delivery;	• Formulation, implementation and monitoring of agricultural legislations, regulations and policies • supporting agricultural research and promoting technology delivery	Public	Cathedral Road, Nairobi P. O. Box 34188-00100 Kenya E-mail: info@kilimo.go.ke

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		• Facilitating and representing agricultural state corporations in the government; • Development, implementation and coordination of programmes in the agricultural sector; • Regulating and quality control of inputs, produce and products from the agricultural sector; • Management and control of pests and diseases; • Collecting, maintaining and managing information on agricultural sector.			Tel: +254-20-2718870 www.kilimo.go.ke
7.	Ministry of Health	• Development of policies aimed at the provision of high quality and affordable health care. • Provides Technical assistance to Counties	• Help in developing policies that guide and enhance healthcare related innovations	Public	Afya House, Cathedral Road, P.O. Box: 30016–00100, Nairobi, Kenya. Tel: +254-20-2717077 Email: ps@health.go.ke
8.	National Commission for Science, Technology and Innovations	• Regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related to ST&I	• Regulate and assure quality in the science, technology and innovation sector	Public	Off Waiyaki Way, Upper Kabete, P. O. Box 30623, 00100 Nairobi, Kenya Tel: 020 4007000/ 020 2241349 E-mail: customercare@nacosti.go.ke /info@nacosti.go.ke
9.	Vision 2030 Delivery	• Spearheading the implementation of Vision 2030 as the country's blueprint and strategy towards making Kenya a newly	• Spearheading the implementation of Vision 2030 as the country's blueprint and strategy towards making Kenya a newly industrializing middle-income	Public	Kussco Centre, 2nd Floor, Upper Hill, P.O. Box 52301-00200,

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
	Secretariat	industrializing middle-income country • Providing strategic leadership and co-ordination in the realization of the overall goals and objectives of the Vision 2030 and its Medium Term Plans.	country		Nairobi, Kenya Tel: +254 20 272 20 30, +254 20 272 22 006 Email: info@vision2030.go.ke
10.	Kenya National Innovation Agency	• Institutionalize linkages between universities, research institutions, the private sector, the government, and other actors in that system; • Establish and regularly update a database on innovation in collaboration with other relevant institutions; • Establishing and maintaining strategic international and regional innovation cooperation platforms;	• Establish and regularly update a database on innovation. • Establishing and maintaining strategic international and regional innovation cooperation platforms;	Public	10th Floor, Utalii House P.O Box 30568-00100. Nairobi, Kenya Tel +254-020-2219420. Email:info@innovationagency.go.ke.
11.	Information and Communication Technology Authority	• Rationalizing and streamlining the management of all Government of Kenya ICT functions; Enforcing ICT standards in Government and enhancing the supervision of its electronic communication; • Promoting ICT literacy, capacity, innovation and enterprise in line with the Kenya National ICT Master plan 2017.	• Promoting ICT literacy, capacity, innovation	Public	Teleposta Towers, 12th Floor, Kenyatta Avenue, P.O. Box 27150 - 00100, Nairobi, Kenya. Tel: +254 20 2211960 +254 20 2211961. E-mail: info@ict.go.ke communications@ict.go.ke
12.	Kenya Institute for Public Policy Research and Analysis	• Improve public policy making for realization of national development goals, through economic forecasting, policy analysis and research, and formulation of medium and long-term strategic perspectives for	• Identify and undertake independent and objective programs of research and analysis, including macroeconomic, inter-disciplinary and sectoral studies on topics	Public	2nd Floor Bishops Garden Towers, Bishops Road P.O. Box 56445-00200,

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		economic and social development	affecting public policy in areas such as human resource development, social welfare, environment and natural resources, agriculture and rural development, trade and industry, public finance, money and finance, macroeconomic and microeconomic modeling		Nairobi, Kenya Tel: +254 20 4936000 / 2719933/4 Email: admin@kippra.or.ke
13.	Kenya National Academy of Sciences	• Cooperate and collaborate with the Government of Kenya, other scientific organizations and the general public in the mobilization of the scientific community in Kenya for the promotion of the scholarly application of all aspects of science and technology for national development.	• To promote the advancement of scientific and technological knowledge to establish and enhance standards of scientific and technological endeavor and achievement in Kenya and to recognize outstanding contributions in the fields of science and technology.	Public	Utalii house, 8th floor, room 812 P.O. Box 39850 Nairobi, Kenya Email: secretariat@knascience.org Tel: +254 020 311714
14.	National Economic and Social Council	• Advisory to the Government of Kenya and provides timely, accurate and independent economic and social advice to improve the management of the economy	• Advisory to the Government of Kenya and provides timely, accurate and independent economic and social advice to improve the management of the economy	Public	Cooperative Bank Building 21st Floor, Haile Selassie Avenue. P.O. Box 62345 - 00200 Nairobi, Kenya
15.	Technical Vocational Education and Training Authority	• Regulate TVET sector through licensing, registration and accreditation of institutions, programs and trainers.	• The Technical and Vocational Education and Training Authority is mandated to promote quality and relevance in Technical and Vocational Education and Training by regulating	Public	TelePosta Towers 25th Floor, Wing B, Kenyatta Avenue P. O. Box 35625 – 00100, Nairobi, Kenya

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
			Inspecting the TVET institutions.		Tel: +254 20 2392140 E-mail: info@tvetauthority.go.ke.
16.	Kenya National Bureau of Statistics	• Principal agency of the government for collecting, analyzing and disseminating statistical data in Kenya. • Custodian of official statistics. • Conduct the Population and Housing Census every ten years, and such other censuses and surveys as the Board may determine. • Maintain a comprehensive and reliable national socio-economic database. • Establish standards and promote the use of best practices and methods in the production and dissemination of statistical information across the NSS; and • Plan, authorize, coordinate and supervise all official statistical programmes undertaken within the national statistical system	• Establish standards and promote the use of best practices and methods in the production and dissemination of statistical information across the NSS	Public	Real towers, Hospital Rd, Nairobi, P.O. Box 30266–00100 Nairobi, Kenya Tel: +254-20-3317583 /3317612 /3317623 /3317622 /3317588 /3317586 /3317651 Hotline Numbers: 0701244533, 0735004401 Email: info@knbs.or.ke , directorgeneral@knbs.or.ke .
17.	Konza Technopolis Development Authority	Sustainable, world class technology hub and major economic driver for Kenya.	• Sustainable, world class technology hub and major economic driver for Kenya	Public	Westlands, Capital West Business Centre 5th Floor, Opposite New Rehema House at the intersection of Rhapta Road & Lantana Road P.O. Box 30519-00100 Nairobi, Kenya Tel: +254(0) 204343013/4

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Email: konza@konzacity.go.ke.
18.	Kenya National Research Fund	Facilitate research for the advancement of science, technology and innovation as provided in Section 33 of the ST&I Act, 2013	• To facilitate research for the advancement of science, technology and innovation as provided in Section 33 of the ST&I Act, 2013	Public	Utalii House, Utalii Lane 9th and 10th Floor, P.O. Box 26036-00100, Nairobi, Kenya Tel: 020-4403386
19.	Engineers Board of Kenya	Registration of engineers and engineering consulting firms; Regulation of engineering professional services; Setting of engineering standards; Development of the general practice of engineering; and Training and capacity development	• Establish the Kenya Academy of Engineering and Technology whose purpose shall be to advise the National and the County Governments on policy matters relating to engineering and technology	Public	Transcom House Annex, 1st Floor, Ngong Rd, P.O. Box 30324-00100 Nairobi, Kenya Tel: +254-20-2719974 Cell: +254-735-330744, +254-722-509972 Email: registrar@ebk.or.ke Website: www.ebk.or.ke
20.	Export Promotion Council	• Focal point for export development and promotion activities in the country.	• Focal point for export development and promotion activities in the country.	Public	Anniversary Towers 1st and 16th floor along University Way P.O. Box 40247-00100, Nairobi, Kenya Tel. +254 20 222 8534-8. Cell: +254 722 205 875 or 734 228 534. Fax: +254 20 222 8539 or 221 8013
21.	E-Government	Official Digital payments platform that enables Kenyan citizens ,	• Use of information and communication technologies	Public	Presidency and Cabinet Affairs Office

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		residents and visitors access and pay for government services online	(ICTs) to improve the activities of public sector organizations		P.O. Box 62345-00200, Nairobi, Kenya Tel: (020)2227411 and (020)2252139.ffice Email: support@ecitizen.go.ke Website: www.mygov.go.ke
22.	Council of Governors	Promotion of visionary leadership; sharing of best practices and; offer a collective voice on policy issues; promote inter – county consultations; encourage and initiate information sharing on the performance of County Governments with regard to the execution of their functions; collective consultation on matters of interest to County Governments	• Encourage and initiate information sharing on the performance of County Governments with regard to the execution of their functions; collective consultation on matters of interest to County Governments.	Public	Delta Corner, 2nd Floor, Opposite PWC Chiromo Road, Off Waiyaki Way P.O Box 40401 - 00100 Nairobi, Kenya Tel: +254 (020) 2403313/4 +254729777281 Email: info@cog.go.ke
23.	National Biosafety Authority	Regulate research and commercial activities involving GMOs with a view of ensuring safety of human and animal health and provision of an adequate level of protection of the environment.	Regulate research and commercial activities involving GMOs with a view of ensuring safety of human and animal health and provision of an adequate level of protection of the environment.	Public	Red Hill Road, off Limuru Road, Gigiri. P.O. Box 28251 - 00100, Nairobi, Kenya Email: info@biosafetykenya.go.ke http://www.biosafetykenya.go.ke.
24.	Commission for university education	Promote the objectives of university education, by regulating and accrediting universities and	Encourage Science based courses in the Universities.	Public	Red Hill Road, Off Limuru Road, Gigiri. P.O. Box 54999 – 00200,

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		programmes			Nairobi, Kenya Tel: +254 – 020 –7205000, 020-2021150, 020-2021154/56 +254–726-445566, +254–717-445566, +254–780-656575 Fax: 254-020-2021172 Email: info@cue.or.ke
25.	Higher Education Loans Board	• Provide affordable loans to Kenyans pursuing Higher Education through adequate mobilization and prudent management of resources	• Provide affordable loans to Kenyans pursuing Higher Education through adequate mobilization and prudent management of resources	Public	Anniversary Towers, University Way Tel: +254 711 052 000 Email: contactcentre@helb.co.ke
26.	Universities Funding Board	Advise the Cabinet Secretary in matters of university education funding and related policy issues. In consultation with the Cabinet Secretary, develop transparent and fair criteria for allocation of funds to universities. Apportion funds to universities in accordance with criteria established. Mobilize and receive funds for purposes of the Fund from the Government, donors, and from any other source. ,	To catalyze the transformation of education and research in Kenya using community ICT services	Public	Teleposta Building 27th Floor P.O. BOX 9583- 00200, NAIROBI TEL:0746737935 EMAIL: info.ufb027@gmail.com

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
27.	Curriculum Development, Assessment and Certification Council	• Undertake design and development of curricula, examination, competence assessment and certification in TVET	• Undertake design and development of curricula, examination, competence assessment and certification in TVET	Public	Teleposta Towers, 25th Floor, Wing C P.O Box 15745-00100,Nairobi, Kenya Tel +254 20 2217210 Extension 2503/2506/2521 Email:cdacc.tvet@gmail.com
28.	Kenya National Qualifications Authority	Coordinate and harmonize education, training, assessment and quality assurance of all qualifications awarded in the country; with the view to improving quality and international comparability.	• Coordinate and harmonize education, training, assessment and quality assurance of all qualifications awarded in the country; with the view to improving quality and international comparability.		Uchumi House, 6th Floor Aga Khan Walk. P.O. Box 72635-00200, Nairobi. Email: knqa.go.ke@gmail.com
29.	Kenya Universities and Colleges Central Placement Service	Promote equity and access to university and college education, by among other things, developing criteria for affirmative action, for the marginalized, the minorities and persons with disabilities. Establish criteria to enable students to access the courses for which they applied taking into account the students' qualifications and listed priorities.	• Establish criteria to enable students to access the courses for which they applied taking into account the students' qualifications and listed priorities.	Public	ACK Gardens, 1st Ngong' Avenue, Upperhill Nairobi P. O. Box 105166 – 00101 Nairobi, Kenya Telephone : 0723954927, 0734879662 Email : info@kuccps.ac.ke Website: kuccps.ac.ke
30.	Kenya Private Sector Alliance	• Bring together business community in a single voice to engage and influence public policy for an enabling business environment	• Bring together business community in a single voice to engage and influence public policy for an enabling business environment	Private	5th Floor, Shelter Afrique Building, Mamlaka Rd. P.O. Box 3556-00100

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Nairobi, Kenya. Tel: 254 202730371|2|2727936|883 +254 720 340949|735 999979. Email: info@kepsa.or.ke
31.	Kenya Association of Manufacturers	• Promote trade and investment, uphold standards, encourage the formulation, enactment and administration of sound policies that facilitate a competitive business environment and reduce the cost of doing business	• To create wealth at both corporate and individual levels by advocating for a competitive environment for businesses to operate, thereby creating better industries, growing the economy, creating jobs and hence resulting in better standards of living for Kenyans.	Private	Mwanzi Road opposite West Gate Mall, Westlands, Nairobi, Kenya Tel: +254 (0) 722201368, 734646004/5 T: +254 (020) 232481 Email: info@kam.co.ke
INSTITUTIONS RESPONSIBLE FOR STANDARDS AND INTELLECTUAL PROPERTY RIGHTS					
1.	Kenya Industrial Property Institute	Administer industrial property rights, Provide technological information to the public, promote inventiveness and innovativeness in Kenya; and Provide training on Industrial property	Provide technological information to the public, promote inventiveness and innovativeness in Kenya	Public	Popo Rd. off Mombasa Rd. South "C" Weights and Measures Complex P.O. Box 51648 -00200, Nairobi, Kenya Tel: (254) 702 002 020 (254) 202 386 220. Cell:0736-002020, 0702-002020, 0706357664, 0706358049 Email: info@kipi.go.ke
2.	Kenya Bureau of Standards	Standards development and harmonization, testing, measurement (Calibration) enforcement of standards, product inspection, education and training in Standardization, Metrology and Conformity Assessment, management	To make arrangements or provide facilities for the testing and calibration of precision instruments, gauges and scientific apparatus, for the determination of their degree of accuracy by comparison with standards approved by the Minister on the recommendation of the Council, and for	Public	Kenya Bureau of Standards, Popo Road, Off Mombasa Road, Past Bellevue cinema. P.O. Box 54974 - 00200, Nairobi, Kenya

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		Systems Certification and product certification	the issue of certificates in regard		Tel: (+254 20) 6948000, PVoC: +254724255242 Fax: (+254 20) 6948575 Email:info@kebs.org
3.	Kenya Copyright Board	Direct, coordinate and oversee the implementation of the laws and international treaties and conventions to which Kenya is a party to and which relate to copyright and other rights recognized by the Act and ensure the observance thereof. License and supervise the activities of Collective Management Organizations as provided for under the Act. Device and implement training programmes on copyright and related rights. Constant review of the copyright and related rights law. Enlighten and inform the public on matters relating to copyright and related rights. Maintain an effective databank on authors and their works; administer all matters of copyright and related	Direct, coordinate and oversee the implementation of the laws and international treaties and conventions to which Kenya is a party to and which relate to copyright and other rights recognized by the Act and ensure the observance thereof.	Public	NHIF Building, Ragati road 5th Floor P.O. Box 34670 00100. Nairobi, Kenya Tel: (254 20) 253 38 69.

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		rights in Kenya as provided for under this Act; and deal with Ancillary matters connected with its functions under the Act. Ensure the protection of traditional knowledge and traditional cultural expressions.			
OTHER INSTITUTIONS					
1.	Youth Agency for Development of Science, Technology and Innovations	Create purpose driven networks and linkages with stakeholders in ST&I, institutions of higher learning and communities through education, research and application of ST&I on specific challenges facing Kenyans ST&I hubs (7 themes)	Create purpose driven networks and linkages with stakeholders in ST&I, institutions of higher learning and communities through education, research and application of ST&I on specific challenges facing Kenyans	Public	KARLO Muguga South Complex, P.O.Box 105360-00101, Nairobi, Kenya Tel: +254 720 625527 Email: yadsti.org
2.	Linking Industry With Academia (LIWA)	Curriculum Development and CBET(Competency Based Education and Training)system Infrastructure Development for Academic institutions Academic Accreditation Research and Development (R & D) Developing centers of Excellence	Research and Innovation production and system	Public	New Rehema House, 2nd floor Westlands P. O Box 66031-00800, Nairobi- Kenya Tel: +254 (0)20 2323 389 Email: info@liwaprogrammetrust.org

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
3.	Youth Agenda	Research and make available information on key youth issues to policy makers, youth organizations, institutions of learning and youth; this helps define policies affecting youth, aids youth advocacy work in Kenya, and keeps citizens informed of pertinent youth issues.	Research and make available information on key youth issues to policy makers, youth organizations, institutions of learning and youth	Public	Kirichwa Lane Court, Off Ngong Road, P.O.Box:10174-00100, Nairobi, Kenya Tel : 020 2022026 Email: info@youthagenda.org
4.	United Nations Education Science and Cultural Organization	Develop educational tools to help people live as global citizens free of hate and intolerance. Promote cultural heritage and the equal dignity of all cultures Foster scientific programs and policies as platforms for development and cooperation. Serves as a laboratory of ideas, thus helps countries adopt international standards and manages programs that promote cooperation, the free flow of ideas and access to quality education for all.	Foster scientific programs and policies as platforms for development and cooperation Serves as a laboratory of ideas, thus helps countries adopt international standards and manages programs that promote cooperation, the free flow of ideas and access to quality education for all	Development Partner	Kenya National Commission for UNESCO,14th floor National Bank Building, Harambee Avenue P.O. Box 72107-00200 Nairobi, Kenya Telephone: (254-20) 2229053/4(SecGen); E-mail: sg@unesco.go.ke; eva.njoka@unesco.go.ke; paloo@unesco.go.ke
5.	Rift valley Innovation Center	Promote entrepreneurship, business incubation and mentorship by providing ICT infrastructure and expertise	Promote entrepreneurship, business incubation and mentorship by providing ICT infrastructure and expertise		Eldama Ravine Baringo, Kenya
ACADEMIA					
1.	University of	To provide quality university	Science and Technology Parks	Public	P.O. Box 30197, GPO,

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
	Nairobi	education and training.	Nairobi innovation week brings together partners from government, private sector, development partners and research centers with an aim of providing a platform for show-casing and encouraging innovation.		Nairobi, Kenya Tel: (+254-20) 3318262/ (+254-020) 2429997 Email: pr@uonbi.ac.ke Contact person: Dr. Kamau Gachigi
2.	Egerton University	Advancement of knowledge through teaching, scholarly research and scientific investigation; Promotion of learning in the student body and society generally;	Agro-Science Park to link industry, farmers and communities to market and commercialize these products. Overall mandate is to provide infrastructure and incubation space for transforming innovative ideas into new agro products and services for commercialization in partnerships with the industry.	Public	Egerton University Njoro Campus P.O Box 536- 20115 Egerton, Kenya Tel: 254-051-2217891/2 254-051-2217781 Email: info@egerton.ac.ke
3.	Kenyatta University	To provide quality education, training and promote scholarship and innovation	Chandaria Business and Innovation Incubation Centre - Business Incubation and Innovation Hub	Public	Director, Chandaria-BIIC Office: Tel: +254 020 8710901-10 Ext. 3870 Cell: +254 700 363 741 Email: director-cbiic@ku.ac.ke Website: www.ku.ac.ke/chandaria-biic
4.	Jomo Kenyatta University of Agriculture and Technology	To offer accessible quality training, research, innovation and entrepreneurship in order to produce leaders to suit the needs of a dynamic world.	Nairobi Industrial & Technology Park- enhance uptake of research results by industry players. JKUAT Tech Expo-to encourage and support students' innovative ideas across the country in a bid to bolster innovation, collaboration and education, tackling	Public	P.O. Box 62,000 – 00200 Nairobi, Kenya Telephone: 067-5870001/2/3/4/5, Email: info@jkuat.ac.ke

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
			problems across all sectors effectively Business Incubation Centre - to translate student innovations into viable business outputs.		
5.	Masinde Muliro University of Science and Technology	To provide excellent university education, training and research through integrating science, technology and innovation into quality programmes to suit the needs of a dynamic world.	Innovation on waste management and Eco-schools Initiative -solid waste management within Kakamega, Busia, Bungoma and Vihiga County's using modern technology referred to as KDV a German acronym meaning Catalytic Pressure-less Depolymerization that converts all kinds of solid wastes to Bio-diesel as the end product and then transferring practical skills and knowledge to schools around several counties in Western Region to fight climate change through environmental education	Public	P. O. BOX 190-50100, Kakamega, Kenya Tel: +254 702597360/1 +254 733120020/ 057 2505222/3 Email: info@mmust.ac.ke
6.	Maseno University	To discover, harness, apply and preserve knowledge.	Science, Technology and Innovation Park- promote development, documentation, protection and commercialization of innovations in science and technology.	Public	Private Bag Maseno, Kenya Tel: +254 - 57 - 351620/22 Email: info@maseno.ac.ke
7.	Dedan Kimathi University of Technology (DeKUT)	To provide quality learning environment that fosters research, innovation and technology development	Annual Conference on Science, Technology, Innovation and Entrepreneurship (STI&E)	Public	P.O Box 657-10100, Nyeri, Kenya. Tel: +254612050000 Email: vc@dkut.ac.ke

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					webmaster@dkut.ac.ke Marketing Mobile: 0713123021 Admissions office: 0705688135 Email:admissionsoffice@dkut.ac.ke
8.	Jaramogi Oginga Odinga University of Science and Technology (JOOUST)	To provide quality university education that nurtures creativity and innovation	Centre for Research Innovation and Technology	Public	P.O. Box 210 - 40601 Bondo, Kenya. Tel: Orange Fixed: 057 - 2058000 Orange Wireless: 057-2501804 Safaricom: 0707 - 058000 E-Mail: vc@jooust.ac.ke
9.	Meru University of Science and Technology (MUST)	To provide quality University education, training and research in Science, Technology and innovation.	Training science and technology courses	Public	P.O. Box ,972-60200 Meru, Kenya Phone: +254 712524293+254 799529958 +254 799529959 Email: info@must.ac.ke
10.	Technical University of Kenya (TUK)	To provide technological education and training and to contribute towards research and innovation	Centre for Entrepreneurship Innovation and Technology Transfer - teaching Entrepreneurship Development	Public	Located along Haile Selassie Avenue P.O. Box 52428 - 00200 Nairobi, Kenya. Tel: +254(020) 2219929, 3341639, 3343672

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Email: info@tukenya.ac.ke General inquiries: info@tukenya.ac.ke
11.	Technical University of Mombasa (TUM)	To provide quality education which will advance knowledge, science and technology.	Institute of Research, Innovation and Extension (IRIE)- Initiate collaboration and linkage networks, partnership and resource mobilization, research coordination, research fund disbursement, patenting and commercialization, promoting innovations and creativity dissemination of research findings and extension services, organizing exhibitions and research conferences as well as capacity building and training in research themes among others	Public	Tudor Area, Tom Mboya Street, P.O. Box 90420 - 80100 Mombasa, Kenya Tel: (041)-2492222/3; (041)-2490571; Mobile (+254) 0724955377, (+254)0733955377 Email: info@tum.ac.ke
12.	Kenya Methodist University	To provide high quality education that promotes excellence in scholarship and research.	Training science and technology courses	Private	P.O. Box 267 60200 Meru, Kenya Phone: 064-3131279/3131097 / 020-2118430/26 Fax: 064-30162 Mobile: +254724256162 / +254734310655 http://www.kemu.ac.ke Email: info@kemu.ac.ke
13.	Catholic University of East Africa	To promote excellence in research and teaching	Training science and technology courses	Private	P.O. Box 62157 - 00200 Nairobi, Kenya

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Email: admissions@cuea.edu Mobile: +(254) 724-253733/4 Mobile: +(254) 722-509811
14.	Daystar University	To provide quality education.	Training science and technology courses	Private	P. O. Box 44400-00100 Nairobi, Kenya Tel: 0709 972 000 | 0724 256 408 | 0724 256 409 PR Line: 0716170198 | Marketing Line: 0716170313 Email: admissions@daystar.ac.ke | starsmade@daystar.ac.ke
15.	Strathmore University	To provide quality education.	Training science and technology courses	Private	Ole Sangale Road, off Langata Road, in Madaraka Estate, Nairobi Tel: (+254) (0)703-034000/200/300 Email: info@strathmore.edu.
16.	Kiriri Women's University of Science And Technology (KWUST)	To educate and train individuals through scientific methods.	Training science and technology courses	Private	Pamstech House, Woodvale Grove P.O. Box 49274 – 00100 Nairobi, Kenya Tel: +254 020 444 22 12 Cell: +254 721 435 287

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Email: info@kwust.ac.ke
17.	United States International University- Africa (USIU)	To provide quality education.	Training science and technology courses	Private	Off USIU Road, Off Thika Road (Exit 7), P. O. Box 14634 - 00800, Nairobi, Kenya, East Africa. Telephone: +254 730 116 000, +254 730 116 690, +254 730 116 300 +254 730 116 522, +254 730 116 518 Email: info@usiu.ac.ke / admit@usiu.ac.ke
COLLEGES					
1.	Kenya Medical Training College (KMTC)	To provide quality education.	Training science courses	Public	Off Ngong Road. P.O. Box 30195-00100, Nairobi, Kenya. Website: http://www.kmtc.ac.ke. Email: Admissions Office: info@kmtc.ac.ke
2.	Kenya Institute of Applied Sciences (KIAS)	To provide quality education	Training science courses	Public	P.O. BOX 6421-30100. Eldoret, Kenya Tel: +254 (053) 2031294, +254 (053) 2061500. Email: info@kias.ac.ke.

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
3.	Kenya Wildlife Service Training Institute	To provide quality education.	Training science courses	Public	P.O. Box 842-20117 Naivasha, Kenya Mobile: + 254 700 000 321 & 0731 919 465. Email: kwsti@kws.go.ke.
4.	Gusii Institute of Technology	To provide quality education.	Training technology courses	Public	P.O. Box 222. Kisii, Kenya Mobile: +254700152177 or +254752031300. Email: kisiipoly@yahoo.com, kisiipolytechnic@gmail.com, kisiipolytechnic@kisiipoly.ac.ke
5.	Coast Institute of Technology	To provide quality education.	Training technology courses	Public	P.O. Box 34 Voi, Kenya. Email: registrar@cit.ac.ke. Tel: 0412011393
6.	Kiambu Institute of Science and Technology (KIST)	To provide quality education.	Training science and technology courses	Public	P.O Box 414-00900, Kiambu, Kenya. Tel: 0734 207663 / 0727 807713 Email: principal@kist.ac.ke.
7.	Institute of Advanced Technology (IAT)	To provide quality education.	Training technology courses	Private	Pension Towers 5th Floor, Loita Street, P.O. Box 20653, 00200,

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Nairobi, Kenya Phone:254-020-2226143 Email: registrar@iat.ac.ke
8.	Jodan College of Technology	To provide quality education.	Training technology courses	Private	Alisa Plaza, Kwame Nkrumah Street (Opposite Safaricom customer care), Thika, Kenya Tel: +254 722 916 072, +254 718 248 272 Email: info@jodancollege.com
9.	Kenya Aeronautical College	Excellence in education through expansion of aviation-based careers	Excellence in education through expansion of aviation-based careers	Private	K.A.C Building, Wilson Airport, Nairobi West Nairobi, Kenya. P:(+254) 020-2132045, (+254) 020-604559 M:(+254) 0722-990679, :(+254) 0732-420538 Email: info@kac.co.ke
10.	Amboseli Institute of Hospitality and Technology (AIHT)	To provide quality education.	Training technology courses	Private	Muindi Mbingu (near Thika High School) P. O. Box 2316, 001000, Thika, Kenya Tel: +254. Mobile: 0720 663 860 0752 457 426 0734 628 250 07 22 347 205. Email: info@amboseliinstitute.com.

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
11.	Nairobi Institute of Technology (NIT)	To provide quality education.	Training technology courses	Private	Mogira Road, Off Park Road and Ring Road Ngara P.O. Box 30039 – 00100 NAIROBI - KENYA. Tel: 6760482 / 6764863 / 09. Cell: 0721233394, 0208034403 Fax: 6760357. Email: nairobitechnical@gmail.com OR info@nairobitti.ac.ke.
12.	Royal College of Science and Technology	To provide quality education.	Training science and technology courses	Private	P.O. Box 95, 00232, Ruiru, Kenya Phone: 0715531422, 020 2452717. Email: admin@royalcollegekenya.org.
13.	Sacred Lake Institute of Technology	To provide quality education.	Training technology courses	Private	Meru, Kiirua Market, Along Kibirichia Road. P.O. Box 1186, 60200 Meru, Kenya Tel: 0722-605556, 0716-520320. Email: sacredlakeinstitute@gmail.com
TECHNICAL, VOCATIONAL EDUCATION AND TRAINING (TVET)					
1.	Kaiboi Technical	To provide quality and relevant	Training science and technology courses	Public	P.O. BOX 937 30100

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
	Training Institute	technical training responsive to the dynamic market needs			Eldoret, Kenya Tel: 0733937937; Mobile: 0734937937 / 0727937937 Email: kaiboi@ kaiboitech.ac.ke.
2.	Kisumu Polytechnic	To produce students who are practical oriented and competent in application of technical skills.	Training science and technology courses	Public	P.O. BOX 143, 40100 Kisumu, Kenya Tel: 057-2501501, 2501502. Wireless: 020 2046190, Mobile: 0723 446773. Email: info@kisumupoly.ac.ke
3.	Kitale Technical Training Institute	To provide quality and relevant technical training	Training science and technology courses	Public	Kitale-Kipsongo Road, P.O. BOX 2162 30200 Kitale, Kenya. Tel: 054-30297. Email: kitaletechnical@gmail.com
4.	Nairobi Technical Training Institute (NTTI)	To provide quality education.	Training science and technology courses	Public	P.O. BOX 30039 – 00100 GPO, Nairobi - Kenya.

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Telephone: 6760482 / 6764863 / 09. Mobile: 0721233394, 0208034403 Fax: 6760357. Email: nairobitechnical@gmail.com or info@nairobitti.ac.ke
5.	Ramogi Institute of Advanced Technology (RIAT)	To provide quality, vocational and technical training.	Training technology courses anchored on applied research and innovation	Public	Off Kisumu – Kakamega P.O. Box 1738 – 40100 Kisumu, Kenya Tel: +254 020 2065052. Mobile: 0734-257622, 0723-789372. Email: info@ramogiinstitute.ac.ke
6.	Rift Valley Institute of Science and Technology (RVIST)	To provide quality education.	Training science and technology courses	Public	P.O. Box 52771. GPO 00100 Nairobi Kenya Telephone: +254 728 237 029 or: +254 788 206 746 Email: institute@riftvalley.net.
7.	Rift Valley Technical Training Institute (RVTTI)	To provide quality education.		Public	P.O. BOX 244 - 30100, Eldoret, Kenya Tel: +254(704)244 244 +254(733) 244240, +254(704) 244244, +254 (0729) 621 773,

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Email: info@rvti.ac.ke
8.	Nkabune Technical Training institute	To provide quality technical and vocational training.	Training science and technology courses	Public	P.O.Box 330 60200, Meru, Kenya Tel: 0719 185814/ 0733777788 Email: nkabunetti@yahoo.com
9.	PC Kinyanjui Technical Training Institute (PC K.T.T.I)	To provide quality education.	Training science and technology courses	Public	Off Kabiria Road, Riruta Satellite. P.O. Box 21280 - 00505 Nairobi, Kenya. Tel: +254 773 829 417. Cell: +254 721 480 199. Email: info@kinyanjuitechnical.ac.ke. Or kinyanjuitechnical2008@*gmail*.com.
10.	Kenya Institute of Software Engineering. (KISE)	To provide quality technical training in Science, engineering and technology	Training science and technology courses	Private	New Jogoo Building-3rd Floor, Thika Tel:+254713810752, +254732609809. Email: kenyainstituteofsoftwareeng@gmail.com
11.	Machakos Institute of Technology (MIT)	To provide quality education.	Training technology courses	Private	Kinyali Building, 2nd Floor, Mbolumalu Road, Machakos.

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
					Tel: +254 722 973271
12.	International Centre of Technology	To provide quality education.	Training technology courses	Private	P.O. Box 3612-01002 Madaraka, Thika-Kenya Tel: +254 702404322, 020 2022694, 0702 404 322. Email: academic@ict.ac.ke, admin@ict.ac.ke.
RESEARCH INSTITUTIONS					
1.	Kenya Industrial Research and Development Institute (KIRDI)	Undertake multidisciplinary Research and Development in industrial and allied technologies including: Mechanical, Electrical & Electronics, Chemical, Ceramics and Building Materials, Food, Leather, Textile, ICT, Environment and Energy	Co-operate with the responsible Ministry of industrialization and the relevant research committee in matters pertaining to research policies and priorities. Carry out research and development in the fields specified in the mandate. Co-operate with other organizations and institutions of higher learning in training programmes and on matters of relevant research. Disseminate research findings. Co-operate with other organizations and institutions of higher learning in training	Public	Popo road off Mombasa Road, South C, P.O. Box 30650-00100 Nairobi, Kenya Tel: +254-20-2388216/2393466 Email: dir@kirdi.go.ke

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
			programmes and on matters of relevant research. Liaise with other research bodies within and outside Kenya carrying out similar research.		
2.	Kenya Agricultural & Livestock Research Organization	Expedite equitable access to research information, resources and technology and promote the application of the research findings and technology in the field of agriculture	Promote the application of the research findings and technologies in the country	Public	Kaptagat Rd, Loresho P.O.Box 57811, 00200 Nairobi, Kenya Safaricom: 0722-206-986, 0722-206-988 Airtel: 0733-333-223, 0733-333-224, 0733-333-294, 0733-333-299, 0736-333-294 Email: info@kalro.org
3.	African Institute of Research and Development Studies (AIRADS)	To provide quality education.	Training science and technology courses	Private	4th Floor, Samdyllis plaza, River Road, Nairobi Cell: 0711 454637 Emails: eldoret@airads.ac.ke, nakuru@airads.ac.ke, bungoma@airads.ac.ke, kisumu@airads.ac.ke, kericho@airads.ac.ke, lodwar@airads.ac.ke
4.	Kenya Medical	To deliver high quality research relevant to global health and to build	To cooperate with other research	Public	Off Mbagathi Road,

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
	Research Institute	local capacity for undertaking research.	organizations and institutions of higher learning on matters of relevant research and training. To disseminate and translate research findings for evidence-based policy formulation and implementation.		P.O. Box 54840 00200 Nairobi, Kenya. Tel: +254 020 2713349 / +254 020 2722541 / 0722-20590 Email: info@kemri.org
5.	Kenya Forestry Research Institute	Conduct research in forestry and allied natural resources, disseminate research findings and establish partnerships and cooperate with other research organizations and institutions of higher learning in joint research and training.	The institute conducts research and development activities under five thematic areas namely: Forest productivity and Improvement; Biodiversity and Environment Management; Forest Products Development; Social-economics, Policy and Governance and Technical Support Services.	Public	P.O Box 20412 - 00200 Nairobi, Kenya Tel: +254-724-259781/2, Wireless: +254-2010651/2 Email: info@kefri.org
6.	Kenya Marine and Fisheries Research Institute	Undertake research in "marine and freshwater fisheries, aquaculture, environmental and ecological studies, and marine research including chemical and physical oceanography", in order to provide scientific data and information for sustainable exploitation,	Undertake research in marine and freshwater fisheries, aquaculture, environmental and ecological studies, and marine research including chemical and physical oceanography, in order to provide scientific data and information for sustainable exploitation, management and conservation of Kenya's fisheries and other aquatic resources, and contribute to National strategies of food security, poverty alleviation, clean environment and creation of employment as provided for under Vision 2030.	Public	Headquarter and Mombasa Centre Silos Road, English Point, Mkomani P.O. Box 81651-080100 Mombasa, Kenya Phone: +254-208021561, +254-414475151/4,0712003853 Customer Service: 0202178357 Email: director@kmfri.co.ke
7.	Kenya Plant Health Inspectorate	To assure the quality of agricultural inputs and produce to prevent adverse impact on the economy, the	To assure the quality of agricultural inputs and produce to prevent adverse impact on the economy, the environment and human	Public	P.O. Box 49592-00100

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
	Service (KEPHIS)	environment and human health	health		Nairobi, Kenya Tel: 020 661 8000 Cell: 0709 891 000 Email: kephisinfo@kephis.org , director@kephis.org
8.	Tegemeo Institute of Agricultural Policy and Development (Egerton University)	Conduct Research and Analysis on policy in the domain of Agriculture, Rural development, Natural resources and Environment.	Conduct Research and Analysis on policy in the domain of Agriculture, Rural development, Natural resources and Environment.	Public	Along George Padmore Road, Off Marcus Garvey Road Kilimani. P.O. Box 20498 00200, Nairobi Kenya. Tel: +254-20-2347297 /+254-20-3504316 Cell: +254-734-658 222 Email: egerton@tegemeo.org
9.	Institute of Policy Analysis and Research	Improve public policy making for realization of national development goals, through economic forecasting, policy analysis and research, and formulation of medium and long-term strategic perspectives for economic and social development	Conduct database of social science policy analysis and research, and training, with the aim of improving human welfare	Public	Nabui House 2nd Floor, Unga Lane, Westlands. P.O. Box 45843, 00100 Nairobi, Kenya Tel. 254-020-4441979. Email. info@ipar.or.ke
10.	Institute of Primate Research	Improve human health and biodiversity through advances in basic and preclinical biomedical	Improve human health and biodiversity through advances in basic and preclinical biomedical research and non-human	Public	End of Karen Road P.O. Box 24481, 00502 Nairobi, Kenya

	Name	Mandate	Core competency (in relation to ST&I)	Public /private	Contacts
		research and non-human primate conservation	primate conservation		Tel: +254-02-2606235/6 Email: directoripr@primateresearch.org E-mail: info@primateresearch.org
11.	International Livestock Research Institute	Improving food and nutrition security through increased production and access to animal-source foods and stimulating economic development and poverty reduction through enhanced livestock value chains and increased productivity	Improve food security and reduce poverty in developing countries through research for better and more sustainable use of livestock	Public	P.O. Box 30709 00100 Nairobi, Kenya Phone: +254-20 422 3000 Email: ILRI-Kenya@cgiar.org
12.	Kenya Wildlife Service	To conserve and manage wildlife in Kenya, and to enforce related laws and regulations.	Conduct and co-ordinate, all research activities in the field of wildlife conservation and management and ensure application of research findings in conservation planning, implementation and decision making	Public	P.O. Box 40241 - 00100 Nairobi, Kenya Tel: +254 (20) 2379407 /+254 (20) 2379408/ +254 (20) 2379409 Toll free: 0800597000 Email: kws@kws.go.ke

Annex 2: Institutions dealing with incubation of Innovations in Kenya

S/no.	Name	Description	Contacts
1.	Chandaria Business and Innovation Incubation Centre (BIIC)	Accommodates both Kenyatta University students and other Kenyans in need of support. It also promotes culture of innovation among other Kenyan youth through various programmes and a platform to provide solutions to challenges facing various industries	Director, Chandaria-BIIC Office: +254 020 8710901-10 Ext. 3870 Cell phone: +254 700 363 741 Email address: director-cbiic@ku.ac.ke Website:www.ku.ac.ke/chandaria-biic Kenyatta university
2.	AKIRACHIX	Non-profit organization that aims to inspire and develop a successful force of women in technology who will change Africa's culture	SavelBerg Retreat Center, Muringa Rd, Nairobi **Phone:** 0723 935796 Email: info@akirachix.com
3.	BITHUB.AFRICA	Commercial block chain accelerator that is driving the adoption of block chain technology and solutions across Africa	Address: Karandini Rd, Nairob Phone: 0725 274191 Email: jambo@BitHub.africa
4.	C4D LAB	Research and Development and start up incubation hub at the university of Nairobi. It aims at contributing towards building the silicon savannah, leveraging on the large University of Nairobi	University of Nairobi Phone: 0705 047432 Email: hello@c4dlab.ac.ke
5.	GROWTH AFRICA	Works with entrepreneurs and companies which through their business make a significant positive difference to their surroundings and society at large	Address: Lenana Towers, 5th Floor Nairobi Phone: 0733 151924 Email: info@growthafrica.com
6.	ILAB AFRICA	Centre of excellence in ICT innovation and development. It is involved in interdisciplinary research, students' engagement, collaboration with government , industry and other funding agencies	Strathmore university, Nairobi Phone: 0703 034000 Email: ilabafrica@strathmore.edu
7.	IBIZAFRICA	Business incubator that carries out the entrepreneurship and incubation theme of iLabAfrica. It seeks to provide a nurturing environment that builds on the potential of the youth to develop ICT solutions and	Strathmore University Student Center, Nairobi Phone: 0703 034000 Email: ilabafrica@strathmore.edu

		businesses that work for the common good of the society	
8.	IHUB	Serve the tech community, by connecting organizations and people, building market relevant solutions and being ahead of the curve of innovation	6th Floor, Senteu Plaza, Galana / Lenana Road Junction, P.O Box 22494 - 00505 Nairobi info@ihub.co.ke
9.	KENYA CLIMATE INNOVATION CENTRE	Provides incubation, capacity building services and financing to Kenyan entrepreneurs and new ventures that are developing innovative solutions in energy, water and agribusiness to address climate change challenges	Address: 59857 Nairobi KE Phone: 0703 034701 Nairobi Email: info@kenyacic.org
10.	LAKE HUB	Technology innovation hub; an open space for entrepreneurs, technologists, investors and makers	Address: Okore Rd, Kisumu Phone: 0774 44000 Email: info@lakehub.co.ke
11.	LIVING LAB	Co-creative space for researchers and experts who have a common interest in sustainable urban change. At the living lab, researchers explore design thinking both as a facilitatory tool and a research and as a research method for innovating in the urban space	University of Nairobi Phone: 0705 047432 Email: amollo@livinglab.co,ke
12.	MLAB	Aims to foster innovation and entrepreneurship within the Kenyan community, with a focus on web and mobile services. The lab provides a full range of resources and initiatives; training, business development support and community creation.	3rd Floor, Bishop Magua Centre, George Padmore Ln, Nairobi. Email: contact@webfoundation.org
13.	MT.KENYA HUB	Incubates startups, accelerate innovations, offer training and provide innovators a platform to get funded by selected investors. Working with partners the labs holds events including meetups, training and hackathons	Cell: +254 726 857 785 Address: Milestone Bldg, Total Membley, Northern Bypass Nairobi Kenya Email: hello@mtkenyahub.com
14.	NAILAB	A business incubator that offers an entrepreneurship programme focusing on growing innovative technology driven ideas. The lab	Address: 4th Floor, Bishop Magua Centre, Nairobi Phone: 0790 492467

		creates an enabling environment that inspires and stimulates innovation and entrepreneurship.	Email: info@nailab.co.ke
15.	NAIROBI GARAGE	A fully serviced, co-working office space for startups, techies and entrepreneurs. Members of the garage have access to hand-picked quality professional services from a network of partners and providers. Members connect also access essential services that are optimized for growth.	8th Floor, Pinetree Plaza, Kaburu Drive Off Ngong Rd. Nairobi. Tel: +254 790 556 955 E: kilimani@nairobigarage.com
16.	NAIROBI THINKLAB	An IBM facility that allows clients and partners from across the middle east and Africa region to gain hands-on experience of IBM's latest cognitive, cloud, big data analytics and mobile technologies. Fitted with some of the most advanced interactive technologies to demonstrate the lab's latest solutions in key areas such as education, health care, water management, public safety and financial inclusion	Catholic University Campus Nairobi Kenya. Tel: +254 703 023 000 Email: admissions@cuea.edu
17.	GODOWN ART CENTRE	East Africa's key institution in nurturing talents in the arts, in a society where artists, confident in their own culture, effectively unleash their creative potential, and make their full contribution to and East African society which value arts and culture as an integral part of life	Industrial Area, Nairobi P.O. Box 27772 - 00506 Mobile: +254 726 992 200 Email: info@thegodownartscentre.com
18.	PAWA 254	It has a hub which serves a community-based working environment. It attracts creatives, techies, change makers and entrepreneurs to work and collaborate in a diverse community focused atmosphere.	Phone : + 1 800 755 60 20 Email: info@pawa254.org Location: 2nd floor, AAYMCA Building, State House Avenue, Nairobi
19.	SEVEN SEAS TECHNOLOGIES (SST) INNOVATION LABS	SST group is taking strides to tackle head-on the challenges the face Kenyan start-up culture: why most fail within their first year	Address: Block 1, Delta Riverside Office Park Riverside Drive, Muthangari, 00800 Nairobi City, Nairobi Phone: 0711 059100
20.	SOTE HUB	Provides an open space for young innovators and start-ups to design	Mombasa Road, c/o Red Elephant Bistro, P.O.Box

		market solutions to local challenges. It provides services such as: incubation, co-working space, impact out sourcing and networking opportunities	213, Voi Tel: 0721 474286 Email: info@sotehub.com
21.	SWAHILI BOX	Is a project of M-Power a community based organization. It is a technology open space which focuses on socio-economic technology empowerment, inspiring and developing individuals and help them develop new and innovative ideas through networking, access to training and support and professional mentoring and coaching	Address: Sir Mbarak Hinawy Road, Mombasa Phone: 0700 832618 Email: info@swahilibox.co.ke
22.	TECHBRIDGE INVEST	Techbridge builds and invests in scalable, sustainable businesses in East Africa. It creates job opportunities and profitable businesses where it is needed	TechBridge Invest Africa Ltd. P.O. Box 10200 – 80101 Bamburi Mombasa, Kenya Phone: 0745 722834 Mombasa
23.	UBUNIFU College of Artificial Intelligence	It is a network of creative entrepreneurs bridging the unmet need for creative actualization in art, culture, technology, media, adventure, entertainment and anything in between. It focuses on emerging creative colonies and the budding creative industries in rural and peri-urban areas	Phone: 0727 634101 Nairobi
24.	VILLGRO KENYA	It is working to inspire a new wave of innovative thinking towards the deep-rooted health challenges in Africa, through social entrepreneurship and impact investment	Email: admin@villgrokenya Phone: +254 20 2212061 9th Floor Nairobi Garage, Pinetree Plaza Kamburu Drive

Annex 3: Events and Exhibitions on ST&I in Kenya

S/NO.	NAME OF EVENT/EXHIBITION	AIM	HOST
1.	Nairobi Innovation Week	Bring together partners from government, private sector, development partners and research centers with an aim of providing a platform for show-casing and encouraging innovation.	University of Nairobi
2.	National Science Week	Bring together academia, researchers, scientists and practitioners from universities, research organizations, industry, civil society, and government to share the outcomes of research, technology and innovation activities	National Commission for Science, Technology and Innovations
3.	JKUAT Tech Expo	Encourage and support students' innovative ideas across the country in a bid to bolster innovation, collaboration and education, tackling problems across all sectors effectively	Jomo Kenyatta University of Agriculture and Technology
4.	Annual Conference on Science, Technology, Innovation and Entrepreneurship (STI&E)	Provide a forum for researchers and practitioners to discuss, engage and publish research information	Dedan Kimathi University of Technology
5.	African Women In Technology Kenya #AWITKenya18	The Africa Women in Tech will be the only of its kind to provide the attendee a unique combination of deep-dive, hands-on tech workshops, information and discussions about education, entrepreneurship, careers in tech, and how to pursue them; networking opportunities with other women in various aspects and careers in technology.	Nairobi Garage
6.	Ruby Conference Kenya 2018 (28^{th} -30^{th} July 2018)	Two day Ruby Conference in Nairobi, the Hub of Silicon Savannah. We're a double-track event with roots in the Ruby community, featuring expert speakers and workshops on topics ranging far and wide. We'd love for you to spend the two days learning and adventuring with us.	Riara university
7.	AION NAIROBI MEETUP	Creates Interoperability across Block chain Networks	Nailab
8.	Kisumu National Polytechnic Annual International Multi-Disciplinary Conference	This platform is intended for researchers, academicians, policy makers, professional bodies and students from all over the world to present their research results and development in their various disciplines. This conference provides unique opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration.	Kisumu National Polytechnic

9.	RVIST AGRIBUSINESS EXPO	Create a platform for interaction and showcasing new technologies, innovations and agribusiness models that would help new and existing agribusinesses become more efficient, sustainable and profitable	Rift Valley Institute of Science and Technology
10.	MEDEXPO AFRICA - KENYA	Create a profile of innovative solutions from leading market players for the benefit of buyers from the medical technology industry, from across the East African region.	Kenya Medical Association
11.	Manufacturing and equipment expo	Create a platform where Kenyan manufacturers come to evaluate and purchase new manufacturing machinery.	Kenya National Chamber of Commerce and Industry/ Kenya Association of Manufacturers

Annex 4: Science and Technology Parks in Kenya

S/NO.	NAME	AREA OF FOCUS	CONTACTS
1.	University of Nairobi Science and Technology Park	ICT, manufacturing and automation technologies, software engineering, pure research and services for business and industry	University of Nairobi Science and Technology Park Loresho Ridge, P.O.Box 29053, 00625 Nairobi Tel: 0720750550 Email: stp@uonbi.ac.ke
2.	Egerton University Agro-Science Park	Provide infrastructure and incubation space for transforming innovative ideas into new agro products and services for commercialization in partnerships with the industry. The Park provides incubation space and infrastructure for nurturing agricultural based innovations into products and services for commercialization.	Egerton University Njoro Campus P.O Box 536 20115 Egerton, Kenya Tel : 254-051-2217891/2 254-051-2217781 Email: info@egerton.ac.ke
3.	Jomo Kenyatta University of Agriculture and Technology Nairobi Industrial & Technology Park	Enhance uptake of research results by industry players.	P.O. Box 62,000 – 00200 Nairobi, Kenya Tel: 067-5870001, 067-5870002, 067-5870003, 067-5870004, 067-5870005 Email: info@jkuat.ac.ke
4.	Moi University Science and Technology Park	Transform the university's research into products ready for the market.	Main Campus, Kesses P.O Box 3900-30100 Eldoret, Kenya Tel: +254 790940508, +254 736138770, +254 771336911 Email: info@mu.ac.ke
5.	Maseno University Science, Technology and Innovation Park	Promote development, documentation, protection and commercialization of innovations in science and technology.	Tel: +254 - 57 - 351620/22 Fax: +254 - 57 - 351221 Email: info@maseno.ac.ke

[i] The amount of money allocated to Research and Development in any given year as a fraction of the GDP of the respective year

[ii] Annual measurement the set of institutions, policies, and factors that set the sustainable current and medium-term levels of economic prosperity

[iii] A set of questions whose answers generate an index on the level of sophistication of a process

[iv] One of the Global Competitiveness Pillars used to measure human development

[v] Refers to people's propensity to embrace and use new technologies for accomplishing goals in home life and at work