TH GAMBIA

**STRATEGY FOR PROMOTING TECHNOLOGY-ENABLED EDUCATION (TEE)
&
SCIENCE, TECHNOLOGY AND INNOVATION (STI) 2021-2024**

[A pillar of the Information and Communication Technology for Development Policy
Statement 2018-2028]

Commissioned

By

The Ministry of Information and Communication Infrastructure

OCTOBER 2020

STRATEGY FOR PROMOTING TEE & STI DEVELOPMENT

TABLE OF CONTENTS

1. ACRONYMS AND ABBREVIATIONS

AU	African Union
ECOWAS	Economic Community of West African States
EU	European Union
UN	United Nations
UNESCO	United Nations Educational Scientific and cultural Organisation
USA	United States of America
USD	United States Dollar
GDP	Gross domestic product
ICT	Information and Communications Technologies
ICT4D Policy	Information Communications Technology for Development Policy
I C ACT 2009	Information and Communications Act, 2009
ISESCO	Islamic Educational, Scientific and Cultural Organisation
ITU	International Telecommunication Union
MoBSE	Ministry of Basic and Secondary Education
MOFEA	Ministry of Finance and Economic Affairs
MOHERST	Ministry of Higher Education Research Science and Technology
MOICI	Ministry of Information and Communications Infrastructure
NAQAA	National Accreditation and Quality Assurance Authority
NATCOM	The Gambia National Commission for UNESCO
NDP	National Development Plan
NaRDC	National Research and Development Council
PhD	Doctor of Philosophy
PPP	Public Private Partnership
R&D	Research and Development
Q1, Q2, Q3, Q4	Quarter 1, Quarter 2, Quarter 3 and Quarter 4
SDGs	Sustainable Development Goals
SOPs	Standard Operating Procedures
STI	Science Technology & Innovation
STISA-2024	Science, Technology and Innovation Strategy for Africa-2024
TEE	Technology-Enabled Education
UNESCO	United Nation Educational Scientific and Cultural Organization

2.   FORWARD

This Technology-enable education and Science Technology and Innovation strategy TEE& STI Strategy encompass measures to increase access to quality education and learning by supporting and implementing the policy formulation and innovation in the application of ICT in education, and the development of ICT skills for innovation.

The transformative effect of ICTs on teaching, learning and innovations are recognised and enforced by this strategy. It is developed to accelerate skills development and innovation in the areas of ICTs to help government improves the livelihoods of our citizens and residents. It is a product of extensive engagement with other government ministries, institutions, the industry and academic institutions.

The defined goals and strategic objectives for technology enabled education (TEE) cover the need for an effective policy framework for TEE, the institutional review process for TEE initiation in the country, a clear governance structure for TEE and having TEE in the national curriculum with its shared understanding.

The key areas for STI equally cover the need for a review of the Gambia's STI Policy and aligning it with the AU STISA-2024 to be supported by a solid and workable governance structure. There is the target of having frameworks for partnership, collaborations and linkages through partnerships for investment in research and innovation as well as the measure to establish a quality national research framework based on a legislative determination of a regulatory framework for STI Development.

Specifically, the TEE initiative within this strategy is to develop ICTs in education with policies for open educational resources (OER) as well as the support of research on technology-enabled learning for evidence-based advocacy and decision-making. As the ecosystem outlines the measures for the government, industry and academic institutions to develop relevant and innovative courses, the institutions by themselves are to use technology-enabled learning for programme delivery.

ICTs are to be seen as effective tools to help reduce workload challenge for the education process, increase efficiencies and engage students and our communities. They would become the right tools to support excellence in teaching and raising student attainment. This strategy is premised on upskilling across the education system in a digitally enabled environment. In articulating the objectives, the strategy is intended to define a framework for establishing expectations and priorities in relation to the objectives of the ICT4D Policy and NDP.

The STI part of the strategy promotes the basic innovation needs as well as the AU Agenda 2063 which is underpinned by science, technology and innovation as multi-function tools and enablers for achieving development goals. The specifics centre on the diversification of sources of growth, sustaining economic growth performance and addressing poverty. The anticipation is for meaningful social transformation and economic competitiveness. It provides a wider ground for the involvement of government institutions, the population, private sector, civil society and Gambians in the diaspora to participate in the country's science and technology programme.

The strategy represents a long-term platform of research and innovation development in our country for a four-year period ending 2024. It is with a profound conviction that it will contribute to The Gambia we want, through a strong political will and trust in our own intellectual capacity.

Mrs. Amie B NJIE
Permanent Secretary
Ministry of Information and Communication Infrastructure

3. EXECUTIVE SUMMARY

This Strategic Plan first provides for an introduction and background to Technology-enable education and Science Technology and Innovation and the current global practices of TEE and STI development. The very basis of the exercise was laid out as well as the process followed in the formulation of this strategic document. There are reflections of the objectives of the NDP as well as the relevance and motivation of TEE and STI. Through this the Government's ultimate objects for TEE and STI strategy were outlined. It is a result of a thorough consultative process with a careful consideration of the Government's desire to deliver citizen centric services for ensuring the provision of improved public services and information in ways that are more beneficial to citizens' operational efficiency.

Each action plan has a given associated cost. It is as a result of the measures being taken by MOICI in the development of an ICT Master Plan for The Gambia. The recognized objectives (action plans/projects) in the Strategic Plan are intended to promote the broad goals of the NDP. As the NDP is set for "good governance and accountability, social cohesion, and national reconciliation and a revitalized and transformed economy for the wellbeing of all Gambians", the objectives and defined activities are linked to the deliverables of the NDP.

In addition to the NDP and ICT4D Policies, this strategy is informed by many other strategic documents at the levels of the UN agencies as well as the AU continental level through the latter's STISA-2024 and the experiences based on earlier implementations. Due consideration was given to the motivating returns in having an effective and efficient framework .

Globally, nations are pursuing within their development agendas TEE and STI. The reason being that technology is seen as both a tool and a catalyst for change in all facets of the social development including education. There are new and innovative practical syllabus with potentials that improve the security of students, education data management, analysis, performance reporting and training programs. STI is now deployed by nations to improve their development outcomes based on commitment to R&D. In fact, UNESCO has since been pushing for adoption and progress of STI as it is essential for economic development and social progress through governance structures and mechanisms.

The goals and objectives identified would have positive transformative effects on both the education process as well as innovations through R&D in the country. The ultimate objectives of the Government in efficient and quality education process and education for the citizens followed by expansion in innovations through R&D for the sustenance of the very governance process and economic development. This is to have impact on all other areas of development within the ICT Master Plan including broadban development, cybersecurity, e-Government etc.

There is a consideration of the gaps in both the TEE and STI based on SWOT assessment. A list of the important findings is provided, and a pointer was made for the challenging gaps and prerequisites in the forms of adequate policy, aligning research to government priorities, technology, existing institutional capacity, relevant accessible infrastructure to stimulate innovation and funding. These challenging gaps and defined prerequisites informed the vision and mission.

The vision is to create "knowledge-based economy" through the mission of accelerating technology-enabled education by injecting quality and value into research, science, technology and innovation sector through measured systematic approaches.

The defined goals and strategic objectives are just the very basic needs for the initiation and or introduction of TEE and STI.

All that is proposed for TEE is as under;

a) *To have a policy framework by carrying out an assessment of the physical needs for TEE and then prepare and endorse a policy for TEE;*

b) *There can be the conduct of an Institutional Review for TEE or in relation to TEE. How to do that – is by national survey, review of institutional policies and strategies (rules) in relation to TEE.*

c) *After that, there can be a clear Governance Structure with a Reporting Framework for TEE through a Scrutiny Committee for TEE initiatives.*

d) *Once that is achieved, there can then be TEE in national curriculum with a shared understanding of the TEE and the use of external resources for teaching and learning.*

As for the STI, the policy targets are;

a) *To cause a review of the Gambia's STI Policy and align it with the AU STISA-2024 with clearer consultative Enforcement Mechanism – that is to address STI readiness, funding, incentives and reinforcement.*

b) *After that, there would be a need to have a Governance Structure for STI by providing the ICT Agency with the mandate to implement the part falling under its mandate – ICTs. This could change if MOICI is to develop the strategy for and on behalf of the concerned Education Ministries.*

c) *This is to be followed by having frameworks for partnership, collaborations and linkages through partnerships for investment in research and innovation (ICT based) by building skills and entrepreneurial culture with 1% of GDP target for research and development.*

d) *Finally, for there to be the establishment of a Quality National Research Framework based on legislative determination of regulatory framework for STI Development, the national research*

agenda, a framework for research, accreditation and quality assurance and licensing framework for research projects for STI.

The summary of the goals, objectives and identified actions for the implementation of this Strategic Plan are contained in an Annex to this Strategic Plan.

*Based on the mapping, issues of risks management and mitigation strategies are considered followed by the crucial issue of funding. This is because the budget considered for this strategy is determined at an estimated total of **D34,970,000 (Thirty-Four Million Nine Hundred and seventy Thousand Dalasis)** in terms of programs to set up the framework. This excludes the cost of the R&D works or the cost of the administration of the ICT Agency as the implementing agency.*

The strategic framework for the strategy's implementation is created to facilitate coordination and accountability. The structure is as under;

```
                                          ┌──────────────────────────────┐
                                          │         ICT Agency           │
                                          └──────────────────────────────┘
                                          ┌──────────────────────────────┐
                                          │       Cabinet Council        │
                                          └──────────────────────────────┘
                          ┌──────────┐    ┌──────────────────────────────┐
                          │  MOICI   │────│ Special Committee of the     │
                          └──────────┘    │     National Assembly        │
            ┌──────────┐                  └──────────────────────────────┘
            │ MoHERST  │                  ┌──────────────────────────────┐
            └──────────┘                  │ Scrutiny Committee (for TEE) │
                                          └──────────────────────────────┘
                                          ┌──────────────────────────────┐
                                          │  N-STIIC (Monitor/Evaluate)  │
                                          └──────────────────────────────┘
                                          ┌──────────────────────────────┐
                                          │ Mechanism for Research and   │
                                          │ policy analysis at the       │
                                          │ National Assembly            │
                                          └──────────────────────────────┘
```
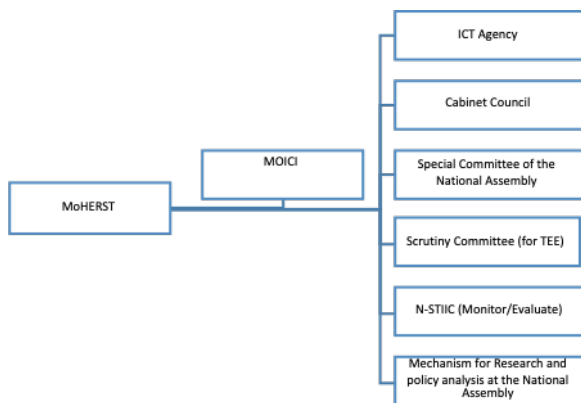
This Strategy adopts the traditional project financing approach where the entire project is funded through Government budgetary resources (based on the AU's committed 1% of each member's GDP to be allocated for STI R&D innovation projects) and operated by an Agency for the Government. Other funding measures like full privatisation or PPP are considered. Lastly, the issue of looking out for donor support is encouraged as a number of donors have in recent years increased their support for R&D especially UNESCO.

In order to achieve the goals and objectives of this Strategy there will be a coherent and steady monitoring and evaluation of the outcome indicators by the ITC Agency. There will be a midterm review of the strategy's implementation at the end of the second (2nd) year and a full review at the end of the fourth (4th) year. The MoHERST and ICT Agency shall come up with a review framework for approval by the Government.

4. INTRODUCTION

This strategic document outlines the goals and objectives for the promotion of Technology-Enabled Education referred to as "TEE" for the purposes of this Strategy and Science Technology and Innovation (also referred to as "STI") in The Gambia by the use of ICTs. The strategy is premised on two dimensional cornerstones, to wit;

a)   Defining goals, objectives and strategies for the promotion of TEE;

b)   Defining goals, objectives and strategies for the promotion of STI;

Technology-Enabled Education (hereafter to be called TEE) is considered as the application and use of ICTs to the art and process of teaching and/or learning in an educational context. The middle word 'enabled' connotes facilitation, and of education through the use of technology. The objective is to enhance the art and process of education through human-technology interaction.

Technology has always been having a special promotional role in the field of education especially with the kaleidoscopic changes in ICTs in the past two decades. This becomes more prominent with the invention of the Internet in the late 1980s as well as the World Wide Web in 1995. The current pace of globalisation and the growth in the adoption of ICTs by Governments and educational institutions is phenomenal. ICTs are today enhancing education in many ways. This is manifested by the recent moves of the Government of The Gambia to facilitate education through the use of Television and Internet in responding to Covid-19. The sudden growth in ICTs especially mobile telephones, tablets, access to cheaper internet and application services unlike a decade ago are all contributing towards the enhancement of education.

However, there are gaps in the technologies, their access in terms of their use for education in The Gambia and this strategy as an intervention is planned to address those gaps and enhance education through ICTs. The pointers to address relate to having appropriate policies, technology infrastructure, teachers' capacities and learners for the much-needed enhancement and for The Gambia to to take full advantage of the ICTs and opportunities for TEE.

As TEE is considered to be more effective if it is done with a calculated degree of innovation and skills, STI as the second phase of the strategy becomes important. The key word "innovation" relates to a process through which ideas can be transformed into new service or processes through ICTs for, among others, a better competitive advantage especially in an educational environment. There is need for this innovation to enable The Gambia effectively occupy a place in the world marketplace and in taking advantage of its the domestic market offerings. With a a

measure of important innovations, almost all established institutions in The Gambia could have a challenging future.

As the innovations in ICTs are making the world more global day in and day out, the only way the institutions especially those of education can remain sustainable in the eye of their local stakeholders will be through innovations. The concept of iinnovation is expressed within the context of economic development. To have an effective strategy for science, technology and innovation can only be driven by STI assessment reports and national STI profiles.

This could be appreciated within the context of the NDP which outlines related important measures for the development of the country. These measures are to fast-track growth and economic efficiency. This cannot be done in the absence of a more effective application of science, technology and innovation (STI) in the economy in order to motivate economic growth. This strategy also addresses measures for an objective and optimal use of the country's STI capacities in order to enhance the country's socio- economic development objectives as outlined in the NDP. The goals are set out with practical actions to build STI capacity and to create a more dynamic economy for The Gambia. This is because a country that promotes science will in the long run achieve clear comparative advantages in the global race.

Therefore, the defined measures address public and private sector commitment for economic growth and rebalancing. To achieve some other forms of innovation can result in higher productivity and the creation of high-quality jobs. The broader objective is for The Gambia to achieve the status of a pace setter in running a knowledge-based economy. With the country's size, location and core strengths, the conscious choice of priorities in the form of goals and objectives are to trigger that expected growth.

The goals are expected to promote the commercialisation of science and new technologies hence the need to promote the enhancement of TEE. The businesses in the country are expected to operate in an environment with the right infrastructure necessary to generate large scale innovation in areas where there are higher risks and wider benefits. This begins with investment in TEE. The end being that the science and innovation strategy can only be as good as the people that it can attract, educate, train and retain. This too must be based on partnerships with business, with NGOs, individuals, and with development partners.

Further, this Strategy is also informed by the AU Agenda 2063 that recognizes STI as multi-functional tools and as enablers for achieving continental development goals. The emphasis is on the need for "sustained investment in new technologies and continuous innovation in areas such as agriculture, clean energy, education and

health" in order to ensure Africa's sustained growth, competitiveness and economic transformation. The AU's STISA-2024 is expected to contribute to the achievement of the AU Vision in meeting the knowledge, technology and innovation demands in various AU economic and social sector development frameworks. The mission of STISA-2024 is to "Accelerate Africa's transition to an innovation-led, Knowledge-based Economy".

As an AU member, this Strategy considers the contents and aspirations within the AU's STISA-2024 more specifically those of capacity building, knowledge production and technological innovation.

5.   BACKGROUND

Based on the objectives of the NDP and the ICT4D Policies, the Government of The Gambia is committed to using TEE and STI to help meet its socio-economic development agenda. For MOICI to steer scientific advancement and technological development in The Gambia it is to be guided by a comprehensive Strategic Plan that is to fill the gaps as outlined in this Strategy. Some key areas within the goals and objectives that are being addressed are to facilitate the enhancement of TEE and STI. This strategy is a clear manifestation of that commitment under the leadership of MOICI. As this strategy is prepared in a consultative manner, it envisages a future for TEE and STI with potentials and advancement possibilities for The Gambia.

From the onset the very form and content of the strategy equally informed by the very nature of the existing challenges relating to the needs for the implementation of TEE and STI. These are in the forms of inadequate human resource capacity, limited available funding, infrastructure, coordination etc. The strategy is structured in such a way that these challenges could be addressed as The Gambia embrace best practices in regulation, advisory, coordination and promotion of matters of TEE and STI in the creation of a knowledge-based economy.

With a clear governance framework and a performance management system, it is envisaged that there will be transparency in the implementation of the broad goals through a degree of accountability for targeted results. In the long run, the environment for both the TEE and STI will be grounded on an enhanced organization structure, competitive schemes of service for providers of enhanced-TEE and robust innovations and a sustainable knowledge management arrangement

4.1   The Basis, Process & Links of TEE and STI with NDP

The IC Act of 2009 promotes the use of ICTs for the socio-economic development of The Gambia and this too includes research and development. The NDP and the ICT4D Policies all provide a basis for TEE and STI in The Gambia. The African Union Agenda 2063 as well as ⌜1⌝SEP the Sustainable Development Goals (SDGs) all justify the basis.
⌜1⌝SEP
In effect, the rationale for development of this strategic plan is necessitated by the need to plan for TEE and STI and to align The Gambia's TEE and STI Strategic direction with the NDP. The consultative and participatory approach in carving out this strategy involves information sharing and special session for commentaries on a number of ICT initiatives in relation to education, science and innovation. There have been reviews of some relevant documents based on the direct engagement of the relevant stakeholders.

In addition to the UTG, a key relevant stakeholder among many is MOHERST that is currently handling the policy portfolio of research, science and technology. There is an STI Policy that is being coordinated by MOHERST. There is the NATCOM 6-member commission that coordinates activities within the areas of competence of UNESCO. NATCOM co-ordinates the ISESCO programmes in the country. It is a quasi-government institution that receives subvention from MoBSE (covering salaries and operating costs) with its Minister as its chairperson. NATCOM activities relate to government priorities. Further, there is NAQAA which is a regulatory body that is poised to deliver quality accreditation services with integrity and accountability in The Gambia. The related issues under NAQAA include quality research framework within a relevant regulatory framework. There are some defined actions within the implementation plans.

Therefore, the strategy is a response to the dictates of science, technology and innovation to impact on critical sectors of the country's economy. The role of TEE and STI to achieve SDGs is recognized by the UN as one of the main drivers behind productivity increases in economic growth and prosperity. There is the consideration that to create, develop and diffuse new innovations and technologies together with the related know-how including technology transfer can stimulate economic growth.

Further, the R&D intensity is a major indicator for innovation which is defined in UNESCO 2017 Report as the Gross Expenditure on Research and Development (GERD) as a percentage of Gross Domestic Product (GDP). There is a strong correlation between Research and Development and wealth creation for any country. The statistics and targets in the table below explain the current difference at the global levels.

The Top Five R&D Performing Countries in Terms of R&D Expenditure as a Proportion of GDP	The Top Five Countries Using the Purchasing Power Parity in Billions of $USD	R&D Targets as Percentage of GDP
a) Israel - 4.3%	a) United States - $511	a) EU 3%
b) Republic of Korea - 4.2%	b) China - $452	b) USA 2.7%
c) Switzerland - 3.4%	c) Japan - $166	c) China over 2%
d) Sweden - 3.3%	d) Germany - $119	**d) AU 1%**
e) Japan - 3.1%	e) Republic of Korea $78	
		Comment: Only South Africa, Kenya and Senegal are close to this target all having achieved about 0.8%.

Given the above correlation and targets, this strategy is promoting the objectives of the NDP and the ICT4D Policies. The emphasis within the policies and even in Africa is on the acceleration of the transition to "an innovation-led, knowledge- based economy". ⌐¬
                                                                                    SEP

4.2   Best Practices

A number of the key relevant global developments have been observed and used as a baseline. To start with, the AU Agenda 2063 that has within it the STI strategy covering the period 2014-2024 have been considered. The UN's agreed new global "Agenda 2030" for taking the world on a sustainable pathway was also considered. The best practices principles of universality, partnership and integration have also been duly considered.

A consideration is measured for the development of a foundation building blocks for TEE ad STI, the need for expanding the capacities of the people and institutions and measures for harnessing destructive technologies, data and the challenging issue of managing development challenges and risks.

On TEE, a due observation is made in relation to the matter of capacity building (through UN Agencies) in universities and research institutes globally through which the sum of about $600m was provided as funding, since 2014 with competitively selected 46 centers in 16 countries promoting publications, curriculum updated, regional talent mobility, partnerships, universities' income as the KPIs. There is also the PASET (Partnership for Skills in Applied Sciences, Engineering and Technology) with a Pan-African fund contributed by governments and donors for PhD scholarship, and Research grant Innovation grant

The Human Capital Project that is designed to help countries improve their education, health and social protection systems have been considered. Recognition is made of some UN agencies and the World Bank Group that are working together to find ways to achieve necessary scale of support to countries to formulate and implement STI for SDGs roadmaps.

4.3   The Relevance of Adopting TEE

There are potential benefits that TEE can offer to institutions, teachers and those in the field of education process. This is greatly determined by the nature and context of the concerned educational institutions and of the learners who are to be served. As the benefits are multidimensional, the following are key:

NO	BENEFITS	DETAILS
a)	Increased Technology Use	Increased student numbers and skills for working lives.
b)	Educational Resources	Availability and easy access breeds consistency in the quality of teaching.
c)	Educational Environment	The transformations make any place a ground for learning and its related activities.
d)	Financial Benefits	There is consolidation as the student numbers increase.
e)	Access Without Barriers	All breaking conventional barriers to education are removed or neutralised.
f)	Communication Framework	The learners and teacher's relationship are enhanced through this framework.
g)	Student Focus -Centred	The learning process and focus is transformed into self-directed and student-centred.
h)	Learning Assessment	This is enhanced through flexible assessment feedback methods
i)	Delivery	Flexibility is increased in delivery of teaching.

Generally, there will be quantitative improvements in the form of outcomes for higher marks or grades as well as qualitative improvements through outcomes for deeper understanding, conceptual development and better application of knowledge with the use of ICTs. It must be re-emphasised that there are significant challenges that are to be addressed by this strategy.

6.   THE CHALLENGING GAPS & PREREQUISITES

A major challenge is recognized in the context of the African continental approved STI programme (AU-STISA-2024) and The Gambia's STI Policy 2015-2014.

5.1   African STI Plan and The Gambia's Policy

The Gambia's STI Policy is said to have been aligned to Africa's Science and Technology Consolidated Plan of Action (2005) and the ECOWAS Policy on Science and Technology (2012). The AU Plan of Action is the instrument for the implementation of the decisions of the first African Ministerial Conference on Science and Technology held in Johannesburg, South Africa in November 2003. It gives practical meaning to the decision of Second Ordinary Session of the Assembly of the AU held in July 2003 in Maputo, Mozambique to integrate the NEPAD Programme into the AU structures and processes. On the other hand, the ECOWAS adopted a Policy on Science and Technology (ECOPOST) in 2011 as an integral part of its 10-year plan Vision 2020. The emphasis of this ECOWAS policy is being made to improve data collection to inform national and regional policies.

Therefore, The Gambia's STI Policy is not aligned with AU STISA-2024 being the very latest African continental document for STI adoption and development. Some of the issues in the AU STISA-2024 are mentioned in The Gambia's STI Policy but the related approaches and context are in a number of cases not similar. By considering in detail the actual priority areas of both the AU and The Gambia strategy, there are number of differences in terms of very focus of the priorities. As for the strategic objectives, the AU's is very coherent and STI specific whereas The Gambia's Policy provides for a list of action plans even though a number of those statements are not specifically STI related. As for the implementation, the dates are similar but the actual approach and the contents in each phase may be different since implementation started late in The Gambia. The table in the next page outlines some of the important parameters of the two.

AU STI STRATEGY (STISA-2024) V/S. THE GAMBIA STI POLICY		
	AFRICAN UNION 2014-2024	**THE GAMBIA 2015 – 2024**
BACKGROUND	*The AU Agenda 2063 recognizes Science, Technology and Innovation (STI) as multi-functional tools and as enablers for achieving continental development goals. It is developed during the formulation of a broader and long-term AU Agenda 2063.*	*A national STI Core Team was set up in January 2012 to lead the development process of an NSTIP for The Gambia. The resulting NSTIP is aligned to Africa's Science and Technology Consolidated Plan of Action (2005) and the ECOWAS Policy on Science and Technology (2012).*
RATIONALE	*Responds to the demand for science, technology and innovation to impact on critical sectors including agriculture, energy, environment, health, infrastructure, mining, security and water among others.*	*The NSTIP is an integrated and holistic approach responding to the socio-economic challenges as the past policy approaches to economic growth were yet to achieve the desired effect on the development of the country's home-grown capabilities in STI. The broader aim of this policy is to harness the potentials of STI in improving wealth creation and the quality of life of the citizenry through education and training, technology transfer, technology start-ups, entrepreneurship, macroeconomic and industrial activities.*
	AFRICAN UNION 2014-2024	***THE GAMBIA 2015 – 2024***
VISION	*"An integrated, prosperous and peaceful Africa, an Africa driven and managed by its own citizens and representing a dynamic force in the international arena" through its Agenda 2063.*	*To create and enhance a scientifically cultured society that contributes to the realization of a knowledge-based economy to support and improve the quality of life.*
MISSION	*"Accelerate Africa's transition to an innovation-led, Knowledge-based Economy".*	*"Build and strengthen national capacity and competencies in STI that will enhance the attainment of economic development and national competitiveness".*
PRIORITY AREAS	*Eradication of Hunger and Achieving Food Security;*	*A sound STI ecosystem that enhancs the generation of knowledge, wealth creation and well-being of society.*
	Prevention and Control of Diseases;	*Education and Training*
	Communication (Physical and Intellectual Mobility);	*Elaboration of Indicators and Data Management*
	Protection of our Space;	*Research and Development*
	Live Together- Build the Society;	*Information and Communication Technologies STI Infrastructure*

	Wealth Creation	*Legal and Regulatory Framework*
		Science, Technology and Society
		STI Governance
		Funding and Sustainability
	AFRICAN UNION 2014-2024	***THE GAMBIA 2015 – 2024***
STRATEGIC OBJECTIVES	*Enhance effectiveness of STI in addressing/implementing priority areas.*	*Research* ✓ *Increase investments in R&D for alternative energy* ✓ *Develop and maintain a database on R&D activities* ✓ *Effective audit of the STI ecosystem and strengthen STI R&D capacity*
	Improve technical competencies and institutional capacity for STI development	*Education* ✓ *Make TVET services available and accessible to all;* ✓ *Innovation in science, technology, engineering and mathematics education ;*
	Promote economic competitiveness through fostering innovation, value addition, industrial development and entrepreneurship.	✓ *Provide sports education programmes;* ✓ *Provide adequate and appropriately qualified and experienced personnel;* ✓ *Increase access to, and support youth in, skills acquisition, technical, vocational education and training in both the formal and informal sectors of the economy;*
	Protect knowledge production (including inventions, and indigenous knowledge) by strengthening Intellectual Property Rights (IPR) and regulatory regimes at all levels	*Legal and Regulatory* ✓ *Protecting intellectual property rights;* ✓ *Strengthen the legal and regulatory framework to attract more investments;* *Environment* ✓ *STI for quality and sustainable environment;* ✓ *Promote entrepreneurship and nurture the culture of innovation;*
	Facilitate STI policy reforms, harmonization, science diplomacy and resource mobilisation	*Agriculture - Comprehensive database to cover all aspects of AENR (agriculture)* *Transport* ✓ *Information management systems for transport;* ✓ *STI-related R&D in all transportation systems and infrastructure;*
		Health - To promote and strengthen research in all areas of healthcare; *Energy - Build capacity petroleum resources and supply of energy nationwide;* *Tourism - Encourage and develop a sustainable eco-tourism;* *National Security - Strengthen national security through STI in surveillance technologies and techniques, security systems, security operations and*

	intelligence;
IMPLEMENTATION PHASES OF THE AU STISA-2024
The successful implementation of this STI policy primarily depends on the suitability of the chosen institutional arrangement, the capacities and complementarities of the institutions involved.
Phases	
1: 2014	*Institutional Setting*
2: 2015-2017	*Development and Implementation of the first Set of flagship Programs within the priority areas.*
3: 2018-2020	*Based on lessons learnt and M&E during Phase 2, the second set of flagship programs will be elaborated, implemented and evaluated.*
4: 2021-2023	*Based on lessons learnt and Monitoring and Evaluation during Phase 3, the third set of flagship programs will be elaborated, implemented and evaluated.*
5: 2024	*Final evaluation of the strategy, lessons learnt and impact to date combined with a 360 degree review of current priorities as they have evolved during the ten year period will guide the adoption of objectives, performance metrics and milestones for the next ten year strategic plan.*

5.2   Important Statistics

With a population of 2.34 Million, The Gambia is fourth most densely populated in mainland Africa with a population density of not less than 158 as in 2011. The Gambia is only surpassed by Rwanda, Burundi and Nigeria in terms of population density. With 50.78% of adult literacy rate (2015), the GDP growth for education sector rose from 3.8 in 2005 to 12.3 in 2016.

Based on World Economic Forum's Global Competitiveness Report for 2019, The Gambia's global competitiveness index in 2019 is 45.9. It has a rank of 119th out of 140 in 2018. In 2019 this drops to 124th out of 141. It has a score of 122 for ICT adoption, 118 for skills, 118 for business dynamism and 107 for innovation capacity.
As per the UNDP Human Development Report of 2019, The Gambia has a gross national income per capita of $1,490. Inequality fell in Gambia where the incomes of the bottom 40 percent grew in the range of 60–80 percentage points more than the average. The Gambia has an HDI ranking of 174 with an HDI of 0.466. The life expectancy at birth is 61.7. The expected years of schooling as in 2018 was 9.5. while the mean years of schooling 3.7.

With a lost health expectancy of 13.7 as in 2017 there is 1.1 physicians for every 10,000 people by 2018. There are 11 hospital beds for every 10,000 between 2010-2015.

The HDI Value for female in the Gambia was 0.416   and that of male was 0.500. The rural population with access to electricity is 21% and 78% of the population is using at least basic drinking water sources. The population using at least basic sanitation facilities is 39%. The pupil–teacher ratio in primary school (pupils per teacher) is 36. Based on the general statistics, it is important to summarily establish the gaps in relation to both TEE and STI in The Gambia.

5.3   The TEE Gaps

Based on the preliminary assessment, the following findings reveal some gaps within the domain of the TEE:

a) There is a need to consider a review of the science and technology education policy that (Education Sector Policy 2016-2030) in order to initiate some reform measures for education and training system to put emphasis on science and engineering;

b) There is a need to align TEE and STI research programmes to Government funding priorities with diversified sources of funding ;

c) Promote emerging and appropriate technologies to enhance TEE.

d) The need for clear institutional aims or goals TEE as even the university of The Gambia does not have a specified coherent set of aims or goals for enhancing the achievement of TEE. These set of goals and aims could have addressed its international reach, improving accessibility and flexibility for its students, responding to the needs of potential employers and the current and future learners, cost reduction and improving teaching quality.

e) A lack of clarity on the use of ICTs in education with targeted educational rationale and anticipated outcomes;

f) A number of the teachers still have to know the answers to the questions on why, when and how-to best use technology for teaching and learning;

g) It is difficult to establish or come by some important statistics as for example on the teaching staff with experience of using technology for teaching and learning, the proportion of students with access to computing equipment, the proportion of academic support staff with experience of using ICTs and the capacity of the institutions for TEE.

5.4   The STI Gaps

It must be said that there is increased recognition by the Government and the business sector of the critical role STI plays in economic growth and human development. However, based on the preliminary assessment, the following findings reveal some gaps within the domain of the STI:

a) The adopted STI Policy in The Gambia needs to be better aligned with the AU STISA-2024 that is based on a clearer consultative Enforcement Mechanism – that is to address STI readiness, funding, incentives and reinforcement through the National Assembly.

b) A part of the required infrastructure to support innovation is partly available but there is need to create reasonable access to that infrastructure. This includes broadband Internet and basic telecommunication services that support private sector innovation. There will be a need for reliable electricity supply, water, good transportation networks, laboratory facilities and tax systems.

c) The university of The Gambia and some other research institutes need to further enhance their adoption and use of ICTs in order to become effective building blocks for fostering innovation and technological development;

d) The developing private sector needs further measures of enhancement for the adoption of ICTs in generating innovation as there are no clear and coherent STI support programmes for the private sector for innovation;

e) There is limited or no resources that is made available to the University of The Gambia for STI Development;

f) There is rather no explicitly Government funding allocations for STI that is based on the AU target of 1% of the GDP for research and development for innovation;

g) There is apparent absence of a well-established coordination framework for partnership in STI development. This can be in the forms of bilateral and multilateral cooperation. Good examples of such cooperation include the European Union–Africa Joint Strategy, the India–Africa Science and Technology Initiatives and the China–Africa Science and Technology Partnership.

h) There is low scientific output hence the need for steady investment in STI, expansion of R&D institutions and political support.

5.5   The Prerequisites & Priority Areas

To be able to achieve and register some progress for TEE and STI, the following measures are key:

a) A Clear and comprehensive policy covering both TEE with some serious form of alignment of the mutual requirements and advantages in line with the objectives of the NDP. The alignment of the STI Policy with that of the AU-STISA-2024 through a review work is important.

b) There will be a need for proper consultative management and coordination for the policys' implementation with an addition of the ICT Agency and Scrutiny Committee provided hereunder. The works of the African Observatory for Science, Technology and Innovation (AOSTI) would have to be considered by the organs within the governance framework for reviewing national innovation systems.

c) The ICT Agency and MOHERST are to come up with measures for enhancing human resource capacity science, engineering and technical workforce and public awareness through strengthen stakeholder engagement;

d) The intellectual property rights (IPR) system has to be further strengthen through legislative amendments;

e) Determination of incentives and Government backing for TEE and STI development with the private-sector;

f) Carrying out a review of relevant regulations, develop relevant standards and guidelines for TEE and STI;

g) A clear framework for international cooperation and collaboration has to be worked out in order to attract talent and innovators to work on the country's challenges in relation to TEE and STI;

h) The physical infrastructure more specifically the access to broadband, e-Government platforms, reliable electricity, good transport network etc. all need to be improved upon.

i) Diversified sources of funding for TEE and STI development must be identified;

7.   VISION AND MISSION

The vision and the mission are informed by the NDP objectives and the international commitments of The Gambia and related developments. In simple terms the NDP is promoting the creation of knowledge-based economy. The Gambia being a member of the AU also recognizes the AU's commitments to TEE and STI especially through its STISA-2024. Within this, the AU wants integration, a prosperous and peaceful Africa with an innovation-led knowledge-based economy driven and managed by Africa's citizens.

There is that strong commitment for considering science and innovation as strategic for the realization of the NDP goals and objectives. The vision is for The Gambia to have a knowledge-based economy where innovation as value for businesses and governance thrives. It is hoped to get the best possible outcomes from its own initiated research in science and innovation for the purposes of The Gambia. The strategy is therefore for the Government, for businesses, and for the education system.

6.1   Vision

A knowledge-based economy.

6.2   Mission

Accelerate technology-enabled education for quality and value and build and strengthen national capacity and competencies in STI that will enhance the attainment of economic development and national competitiveness.

6.3   Guiding Principles

As this strategy provides direction for achieving the defined targets for TEE and STI, the following guiding principles would guide the implementation.

6.3.1   Commitment and productivity

There will be unfailing commitment on the part of the Government and the main stakeholders to TEE and STI for the realization of the goals and objectives that is to translate into the achievement of the objectives of the NDP. The stakeholder commitment would also echo the promotion of an environment for inventiveness and innovation in TEE and STI.

6.3.2   Optimal utilization of resources

With its small size, population and limited resources, there will be constant endeavours to have optimal utilization of the limited resources for the benefit of the country.

6.3.3   Relentless Capacity

In order to benefit from TEE and STI, all efforts would be directed at relentless capacity building to enable the country become a pace setter in R&D in relation to TEE and STI.

6.3.4   PPP Engagements

The country's private sector is a valuable performer especially in the ICT sector. The energy would be directed at having public private partnership arrangements for the realization of the targets for TEE and STI development in The Gambia.

8. GOALS AND STRATEGIC OBJECTIVES

7.1 The Goals and Objectives for TEE

7.1.1 Policy Framework

Having a Policy Framework for TEE

a) Carry out an assessment of the physical needs for TEE;
b) Prepare and endorse a policy for TEE;

7.1.2 Institutional Review

Preparing an Institutional Review for TEE

This involves a detailed review of the educational institutions before the introduction and or expansion of TEE through a policy framework in the country. This could be through:

a. A national survey with scope covering access to and use ICTs, the required infrastructure for TEE and the use of ICTs by educational institutions.

b. Reviewing and developing institutional policies and strategies in relation to TEE through the following:

   i. Drafting institutional policies and strategies for TEE

   ii. Drafting Policies for infrastructure and technical support, student assessment, developing students' digital literacy, the professional development of academic staff, advancing and rewarding scholarly activities relating to TEE, for sharing TEE scholarship activities and the sharing of TEE activities

   iii. Auditing existing resources and infrastructure within the institutions in relation to TEE on the hardware and software and the digital infrastructure that is available for TEE.

   iv. Developing the institutional stakeholders in preparation for and during the implementation of TEE.

   v. Engaging academic staff to develop TEE materials and resources.

7.1.3 Governance Structure

Having a Governance Structure with a Reporting Framework for TEE

a) Having a comprehensive national governance framework.
b) Scrutiny Committee for TEE initiatives

7.1.4 TEE in the National Curriculum

Adding TEE to Existing Courses

a) Developing shared understandings and use of TEE terminology within the national curriculum.

b) Encourage the use of external resources for teaching and learning.

7.2 The Goals and Objectives for STI

7.2.1 Policy Alignment

The align the STI Policy in The Gambia with the AU STISA-2024 that is based on a clearer consultative Enforcement Mechanism in addressing STI readiness, funding, incentives and reinforcement. The main goals would be to:

a) To outline measures for improving STI readiness in The Gambia in terms of infrastructure more specifically the access to broadband, e-Government platforms, reliable electricity and good transport network;
b) Identifying and realising the sources of funding for STI development;
c) Determination of incentives for STI development with the private-sector;
d) Strengthen the National Assembly in innovation policymaking;

   i. By establishing a specific National Assembly committee for science and innovation and to serve as an overseer for the implementation of the innovation policy;

   ii. By establishing a research and policy analysis support mechanism for the National Assembly as a whole. The objective is to improve the country's innovative capacities through various policy and legislative reforms.

7.2.2 Governance

Putting in Place a More Consultative Governance Structure for STI;

Recognising the ICT Agency as an important stakeholder with interest for proper management and coordination in the implementation of this Strategy. The main goals of the MoHERST and ICT Agency for TEE and STI would be to:

a) Spearhead the alignment and review formulation in relation to the STI policy;
b) Promote and nurture university–industry research and technology development partnerships, as well as industry partnerships;
c) The MOHERST and the ICT Agency will further:

    i. Promote knowledge and technology transfer from laboratories to businesses;
    ii. Create and use appropriate funding mechanisms or instruments for innovation in public and private enterprises;
    iii. Develop Human Resource Policies and Procedures Manual for the ICT Agency;
    iv. Acquiring an established head office for the Agency;
    v. Promote stronger executive leadership through an STI council;

7.2.3   Collaboration and Partnership

Initiate Collaborations and Linkages through Partnerships for Investment in Research and Innovation;

a) Develop the private sector and promote innovation in businesses.
b) Having a clear framework for international cooperation and collaboration in order to attract talent and innovators.
c) Build skills and entrepreneurial culture to meet market demand.
d) Government special approval and application of 1% of GDP target for research and development.
e) Create awareness for research and innovation.

7.2.4   Research Framework

Establishing a Quality National Research Framework

a) Legislative determination of regulatory framework for STI Development;
b) Developed and implemented national research agenda;
c) A framework for research, accreditation and quality assurance; ⸏
d) A Licensing framework for research projects for STI

9. STRATEGIC ACTIONS

8.1 Strategic Actions for TEE

STRATEGIC ACTIONS FOR TEE				
		OBJECTIVES		**ACTIONS**
GOAL 1 – Policy Framework	a)	Carry out an assessment of the physical needs for TEE;	i.	Identification of the key stakeholders for TEE development;
			ii.	Identification of the resources needed for TEE in the country;
	b)	Prepare and endorse a Policy for TEE;	i.	Basing the policy on the assessment report;
			ii.	Stakeholder consultation;
			iii.	Preparation of Cabinet paper for the policy;
	a)	A national survey with scope covering access to and use ICTs, the required infrastructure for TEE and the use of ICTs by educational institutions.	i.	Determining survey questioners;
			ii.	Engaging GBOS for the conduct of the survey;

GOAL 2 – Institutional Review	b)	Reviewing and developing institutional policies and strategies in relation to TEE	i. Auditing existing resources and infrastructure within the institutions in relation to TEE on the hardware and software and the digital infrastructure that is available for TEE. ii. Identifying, inspecting and verifying the available resources; iii. Evaluating and examining the status and utilization of the resources including the available hardware and software for TEE; iv. Establish the available standards and fitness of the digital infrastructure available for TEE; v. Developing the institutional stakeholders in preparation for and during the implementation of TEE. vi. Recognizing and registering the stakeholders for TEE growth and development; vii. Defining the guidelines in relation to the materials and resources for the adoption of TEE standards; viii. Setting up the organizational framework for stakeholders within the TEE ecosystem; ix. Engaging academic staff to develop TEE materials and resources. x. Identifying the key institutions and staff with interest in TEE development; xi. Creating a database of the materials and resources; The above would be carried out only after identifying the parameters for review, the institutions the conduct of the review based on consultation. The report of the review would be used as a baseline for drafting the institutional policies and

			strategies that cover: ✓ Infrastructure and technical support ✓ Student assessment; ✓ Developing students' digital literacy; ✓ The professional development of academic staff; ✓ Advancing and rewarding scholarly activities relating to TEE; ✓ Sharing TEE scholarship activities; ✓ The sharing of TEE activities;

GOAL 3 Governance Structure	a	Having a comprehensive national governance framework.	Identifying the membership of the governance framework; Having a recognition of the governance framework;
	b	Scrutiny Committee for TEE initiatives	Deciding on the relevance and efficiency factors for the membership of this Scrutiny Committee;
GOAL 4 - TEE in the National Curriculum	a	Developing shared understandings and use of TEE terminology within the national curriculum.	Developing a scholarly approach to Technology-Enabled Learning. Institutional activities aimed at raising awareness of TEE and its potential effects.
	b	Encourage the use of external resources for teaching and learning.	Exploring the use of OER within the institution - Open Educational Resources or Digitized materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research. Having a plan for the students' use of the resources; Communicating the plan to the key stakeholder; Ensuring the acceptance and utilization of the plan;

8.2   Strategic Actions for STI

STRATEGIC ACTIONS FOR STI				
			OBJECTIVES	ACTIONS
GOAL 1 Policy	a)	To outline measures for improving STI readiness in The Gambia in terms of infrastructure more specifically the access to broadband, e-Government platforms, reliable electricity and good transport network;	i. Reassessing the gaps in STI Development; ii. Review of access terms and usage of STI infrastructure including broadband;	
	b)	Identifying the sources of funding for STI development;	i. Government allocating 1% of GDP for R&D; ii. Securing understanding with key development partners for funding; iii. Identifying the stakeholder-beneficiaries eligible for funding in an given year and as per the national R&D plan;	
	a)	Determination of incentives for STI development with the private-sector;	i. Having an annual incentive plan for STI; ii. Government entering into an MoU with the ICT Agency in relation to the incentives;	

		b)	Strengthen the National Assembly in innovation policymaking;	i.	By establishing a specific National Assembly committee for science and innovation that is to serve as an overseer for the implementation of the innovation policy;
				ii.	By establishing a research and policy analysis support mechanism for the National Assembly as a whole. The objective is to improve the country's innovative capacities through various policy and legislative reforms.

GOAL - 2 Governance	a)	Recognizing the ICT Agency for the proper management and coordination of the alignment and implementation.	The ICT Agency to: i. Be part of the alignment and review formulation and implementation of an the strategy; ii. Promote and nurture university–industry research and technology development partnerships, as well as industry partnerships; iii. Promote knowledge and technology transfer from laboratories to businesses; iv. Create and use appropriate funding mechanisms or instruments for innovation in public and private enterprises; v. Develop Human Resource Policies and Procedures Manual for the ICT Agency in relation to TEE and STI; vi. Acquiring an established head office for the Agency;

			vii. Promote stronger executive leadership through an STI council;
			viii. The Government to have a special active cabinet council for promoting TEE and STI;
			ix. The establishment of a framework for the STI Council's relation with the ICT Agency and that of the national Assembly's committee;

GOAL - 3 Collaboration and Partnership	a)	Develop the private sector and promote innovation in businesses.	i. Defining a PPP framework for STI Development; ii. Having identified the potential private sector members for STI development;
	b)	Having a clear framework for international cooperation and collaboration in order to attract talent and innovators.	Identifying the partners for international cooperation including; ✓ Assessing possibilities within the European Union–Africa Joint Strategy; ✓ Considering the India–Africa Science and Technology Initiatives for cooperation; ✓ Looking into China–Africa Science and Technology Partnership for any possible cooperation;
	c)	Build skills and entrepreneurial culture to meet market demand.	i. Identify the skills for STI Development; ii. Carry out a market survey on the needs for innovation, research and development;
	d)	Government approval and application of 1% of GDP target for research and development.	Making sure that there is determination by the Government through the national budget;
	e)	Create awareness for	i. Preparing an

		research and innovation.		awareness campaign plan;
			ii.	Engaging the stakeholders for the awareness campaign;
			iii.	Database on R&D actions;
			iv.	NaRDC set up actions;
			v.	Developed R&D uniform SOPs actions;
GOAL 4 Research Framework	a)	Legislative determination of regulatory framework for STI Development.	i.	Carrying out a review of intellectual property rights (IPR) system;
			ii.	Carrying out a review of relevant regulations and develop relevant standards and guidelines for STI;
			iii.	Preparing and having a register of institutions for R&D;
	b)	Developed and implemented national research agenda;	i.	Identifying the research agendas and the concerned institutions for R&D;
			ii.	Approving and publishing the national research agenda for a given year;

	c)	A framework for research, accreditation and quality assurance;	i. Preparing the framework; ii. Putting in place the required standards and guidelines;
	d)	A Licensing framework for research projects for STI ⌇SEP⌇	i. Drafting and having approved licensing regulations for research projects; ii. Preparing a comprehensive monitoring and evaluation framework for research programmes;

10.   IMPLEMENTATION AND GOVERNANCE ARRANGEMENT

MoHERST as the implementing agency will do the coordination for implementation in consultation with MOICI, the ICT Agency the Cabinet Council and the special committee of the National Assembly and any other relevant institutions that have critical stakes in STI.

This governance framework is expected to facilitate an effective implementation of this strategy in relation to the defined objectives and with the highest degree of transparency, accountability ad entrepreneurship.

The National Council for STI (NCSTI) which is prescribed by the policy with membership from government ministries and other sectors is to provide advice on STI issues particularly R&D and follow up the implementation, harmonization and coordination issues pertaining to STI within this strategy.

MoHERST in consultation with MOICI through the ICT Agency also perform the coordination, monitoring and evaluation of the implementation of this strategy as well as facilitate the establishment of STI agencies, councils and committees that will assist in the implementation of objectives.

The National Assembly Select Committee on STI will provide an oversight function in implementing this strategy and a Scrutiny Committee, with membership of professionals in the academia to conduct an in-depth review of TEE and any related issue that affects TEE adoption.

Further, there will be research and policy analysis support mechanism for the National Assembly as a whole. The objective is to improve the country's innovative capacities through various policy and legislative reforms.
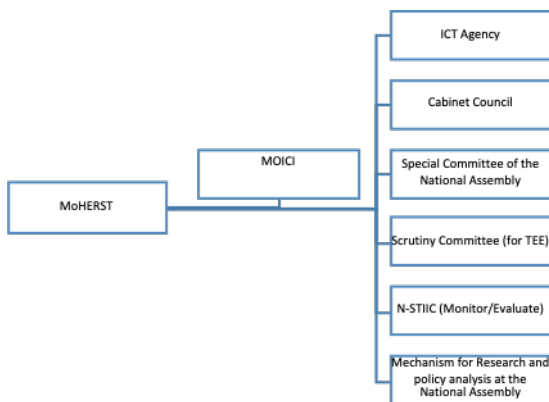
The governance framework would have to come up with some form of adjustment as the implementation is partly dependent on proper funding resources, the relevant tools (laws, regulations and standards), the addressing of the identified prerequisites. This is to be followed by effective monitoring, evaluation and reporting of the implementation process.

11.   RISKS MANAGEMENT AND MITIGATION STRATEGIES

There are risks for the implementation of this strategy. To manage the risks, an outlined risk mitigation strategy is considered, and this is placed in an annex for the purposes of this Plan.

The most important component in the identification of the risks is to have the undivided commitment and support from the Government by making sure that 1% of the GDP is put aside for R&D in ICTS and innovations.

Further, the awareness levels amongst all key stakeholders of the need for TEE and SDTI as well as the commitment of The Gambia in relation to the AU STI Strategy-2024 must be strengthened. There must be advocacy and promotion of the strategy as well as the conduct of national awareness campaign.

Moreover, having an advocacy plan with messages for the different stakeholder groups within TEE and STI would go a long way in ensuring commitment to the objectives of the strategy.

This would be addressing the contribution and impact of TEE, STI and ICT in The Gambia's development especially in view of the objectives of the NDP and the ICT4D Policy. There will be a need to integrate TEE, STI and ICT into The Gambia's development frameworks of the NDP.

Lastly, there is the practice of using evidence-based approach by establishing comparable baselines and performance metrics at national and regional level.

The strategy's success is also based on the active support of the Government more so MOHERST and MOICI. The works of a number of international agencies and cooperation and collaboration groupings cannot be sidelined. All these will add value to the mitigation of the risks.

12.   FUNDING

A critical success factor for the implementation of any TEE and STI policy and Plan is very much dependent on the funding it receives. Accordingly, the following activities are considered for the funding of this Strategic Plan:

a) A policy and any legislative review on TEE and STI have to determine the agreed source of funding and or allocation of 1% of the GDP by the Government for STI R&D. With a GDP of more than D90 Billion would translate into a D9 Million allocation. The transition and path to becoming a knowledge-based economy requires investment in both human capital and infrastructure (including areas of R&D) for STI.

b) Ensuring that the universal service fund under the IC Act of 2009 also serves and facilitates TEE and STI enhancement together with fiscal and other incentives through mentoring and business development services support to high-tech start-ups and high growth firms.

c) Imposing specific levy on special services and or create incentives in the form of tax holidays, duty waivers service support, public-private partnerships for the provision of funding/grants for design/improvement and prototype development that could be used for TEE and STI;

d) The Government will also reconsider streamlining funding for STI within the national development strategies and adapt the STI policy (to be made) to support implementation. Since at the AU level, regions (ECOWAS in our case) are encouraged to establish regional funds to support existing or new regional centers for excellence that respond to STISA-2024, the ICT Agency would have to be considering the priority areas and the cross-border research and innovation collaboration for funding opportunities. This can be in the form of having external technical and financial support in order to help reinforce the domestic funding base.

13.   MONITORING AND EVALUATION

This strategy's successful implementation is will be partly determined by an efficient monitoring and evaluation exercise. There is a need to have a framework to assess and establish the progress in relation to the carved-out objectives. Ultimately the target is to be able to proceed with new initiatives in relation to the strategy.

Having considered the defined goals and objectives, there is the STI information system for the effective monitoring and evaluation. The National STI Information Centre (N-STIIC) to lead on the process and information system.

This N-STIIC will coordinate the implementation process, monitor and report on the strategy's defined activities in relation to the goals and objectives. This will be based on its conduct of quarterly assessment of this strategy using recognize approaches, the use of "technology foresight" programme. Membership of this N-STIIC shall be determined by MOHERST and MOICI on consultation with other stakeholders.

The framework for monitoring and evaluation will be developed by this N-STIIC by taking into consideration the reporting timelines hereunder provided as well as the definition of performance indicators and the tracking of performance.

It will be reporting the progress of implementation on quarterly and annual basis to the other stakeholders. There shall be performance review annually, mid-term and at the end of the term of the strategy, i.e. in the month of December of the fourth year of implementation.

A mid-term review shall take place in the last month of the strategy's second year and this shall be followed by an end term review that is to take place before the end of the final quarter of the last year of the strategy.

The framework for monitoring and evaluation to be developed shall have the objective of facilitating TEE and STI with a degree of certitude, transparency and accountability. It should also enhance the consideration of the measures for the implementation and review of the policy (as recommended) and its related programs. Appropriate TEE and STI indicators should be outlined in the facilitation and building of effective communication and trust amongst all stakeholders.

14.   ANNEXES – STRATEGIC ACTIONS AND COSTS

The Annexes provide details for the implementation of objectives outlined by this Strategic Plan. With the details of the strategic actions, and the related targets and costs, risks have been identified with measures for their mitigation.

13.1   The Strategic Goals

The Goals for Technology-Enabled Education (TEE)

a) *Having a Policy framework for TEE;*
b) *Preparing an institutional review for TEE;*
c) *Having a governance structure with a reporting framework for TEE;*
d) *TEE in the National Curriculum by Adding TEE to existing courses;*

The Goals for Science Technology Innovation (STI)

e) *To cause a review of the Gambia's STI Policy and align it with the AU STISA-2024 with clearer consultative Enforcement Mechanism – that is to address STI readiness, funding, incentives and reinforcement;*
f) *Putting in place a governance structure for STI;*
g) *Initiate collaborations and linkages through partnerships for investment in research and innovation;*
h) *Establishing a quality national research framework;*

13.2 The Strategic Objectives

The Objectives for TEE

a) *Carry out an assessment of the physical needs for TEE;*
b) *Prepare and endorse a policy for TEE;*
c) *A national survey with scope covering access to and use ICTs, the required infrastructure for TEE and the use of ICTs by educational institutions.*
d) *Reviewing and developing institutional policies and strategies in relation to TEE*
e) *Having a comprehensive national governance framework for TEE.*
f) *Scrutiny Committee for TEE initiatives*
g) *Developing shared understandings and use of TEE terminology within the national curriculum.*
h) *Encourage the use of external resources for TEE teaching and learning.*

The Objectives for STI

a) *To outline measures for improving STI readiness in The Gambia in terms of infrastructure more specifically the access to broadband, e-Government platforms, reliable electricity and good transport network;*
b) *Identifying the sources of funding for STI development;*
c) *Determination of incentives for STI development with the private sector;*
d) *Strengthen the National Assembly in innovation policy implementation for STI;*
e) *Facilitating the ICT Agency for proper management and coordination in the making and implementation of this STI strategy.*
f) *Develop the private sector and promote innovation in businesses for STI.*
g) *Having a clear framework for international cooperation and collaboration in order to attract talent and innovators for STI.*
h) *Build skills and entrepreneurial culture to meet market demand for STI.*
i) *Government application of 1% of GDP target for research and development for STI.*
j) *Create awareness for research and innovation for STI.*

13.2.1 Carry out an Assessment of the Physical Needs for TEE		
No	*Parameter*	*Remark/Comment*
1	*Planned Action Type*	*Resource related*
2	*Background to Planned action*	*There is that fundamental need to assess and capture the current state of TEE in The Gambia before any policy or strategic implementation can become effective and rewarding.*
3	*Description of Planned Action*	*To identify and assess all the resources required for TEE development in The Gambia.*
4	*Planned Action Implementation Rationale*	*To have an idea of what is needed for TEE development in The Gambia.*
5	*Planned Action Specific Goals/Objective*	*a) Identification of the key stakeholders for TEE development;* *b) Identification of the resources needed for TEE in the country;*
6	*Planned Action Implementation Prerequisites*	*Having a clear framework and understanding of who the stakeholders and the common resources needed for TEE*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q2 of 2021*
8	*Planned Action Deliverables*	*An assessment report on the status of TEE in The Gambia.*
9	*Time Bound Measurable Targets*	*a) List of the concerned stakeholders* *b) List of the resources* *c) Commentary on the status of each resource*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*A measure of guide on the way forward for the implementation of TEE in The Gambia*
12	*Anticipated Beneficiaries*	*The Government, educational institutions and utilities networks and service providers.*
13	*Resource Mobilisation and Costing*	*Government allocation and universal service funding as well as having 1% of GDP as per AU target*
14	*Planned Action Critical Success Factors*	*a) Awareness on the part of the concerned stakeholders of the importance of TEE*

		b) Getting the right measure of resource identification for the assessment;
15	*Planned Action Implementation Risks*	*Failure on the part of the stakeholders to compliance with the assessment exercise.*
16	*Planned Action Monitoring and Evaluation Indicators*	*a) A clear guide for the development of TEE Policy;* *b) A baseline for future determination of measures and activities for TEE development*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *ICT Agency, MOICI* and MOHERST*, Educational institutions (Universities etc), Utility operators;*

	13.2.2 **Prepare and Endorse a Policy for TEE**	
No	**Parameter**	**Remark/Comment**
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*The TEE sector can only be properly developed through a measured policy with clear goals and objectives.*
3	*Description of Planned Action*	*Drafting a policy for the TEE and having it adopted by the Government*
4	*Planned Action Implementation Rationale*	*To have an officially gazetted instrument that would guide the Government and stakeholders in the development of TEE in The Gambia .*
5	*Planned Action Specific Goals/Objective*	*a) Basing the policy on the assessment report;* *b) Stakeholder consultation;* *c) Preparation of Cabinet paper for the policy;*
6	*Planned Action Implementation Prerequisites*	*a) Effective consultation framework;* *b) Stakeholder participation;*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q1 of 2021*
8	*Planned Action Deliverables*	*An approved policy on TEE*
9	*Time Bound Measurable Targets*	*a) Clearly defined and outlined measures for the development of TEE in The Gambia ;* *b) Having each stakeholder repositioned with a role in TEE development in The Gambia;*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*a) Clarity in approach to TEE;* *b) Efficiency in Education process and service delivery;*
12	*Anticipated Beneficiaries*	*The students, teachers and the Government*
13	*Resource Mobilisation and Costing*	*Government allocation and universal service funding as well as having 1% of GDP as per AU Target*
14	*Planned Action Critical Success Factors*	*a) Clear understanding on the part of all stakeholders;*

			b) Participation by all stakeholders;
15	*Planned Action Implementation Risks*		*Delay in the commencement or initiation of the policy making process.*
16	*Planned Action Monitoring and Evaluation Indicators*		a) *All educational institutions having adopted agendas for TEE;* b) *Having harmony in approaches towards TEE by the stakeholders in the country;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*		➤ *MOICI, PURA and Operators; ICT Agency, MOICI, and MOHERST, Educational institutions (Universities etc), Utility operators;*

13.2.3 A national Survey on Status of TEE and the Use of ICTs by Educational Institutions

No	Parameter	Remark/Comment
1	Planned Action Type	Process and Infrastructure related
2	Background to Planned action	It is absolutely necessary for the very state of TEE in The Gambia to be determined and measured in order to push for the implementation of the goals and strategic objectives.
3	Description of Planned Action	It is to prepare a plan for conducting a survey and this would include identifying the stakeholders, the survey parameters, the timelines and a budget for implementation.
4	Planned Action Implementation Rationale	To have an idea as to the ground realities of TEE and the understanding of the needs of the educational institutions, the students MOICI and MOHERST for the further development of TEE.
5	Planned Action Specific Goals/Objective	a) Determining survey questioners; b) Engaging GBOS for the conduct of the survey;
6	Planned Action Implementation Prerequisites	a) Effective consultation framework with MOICI and GBOS in the center; b) Securing the funding for the survey;
7	Planned Action Time Frame	1st Year of Implementation – by Q2 of 2021
8	Planned Action Deliverables	Survey report on the status of TEE and the use of ICTs by educational institutions
9	Time Bound Measurable Targets	a) All educational institutions being part of the survey; b) Relevant statistics available for informing the making of the TEE Policy
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	a) Improved adoption of TEE in the Gambia; b) Reduced gaps amongst educational

			institutions in their utilisation of ICTs for TEE;
12	*Anticipated Beneficiaries*		*The Students, educational institutions and Government*
13	*Resource Mobilisation and Costing*		*Government allocation and universal service funding as well as having 1% of GDP as per AU Target*
14	*Planned Action Critical Success Factors*		*a) Having the adequate funding for the survey;* *b) Full stakeholder involvement;* *c) Timely conduct of the survey;* *d) Apropriate survey targets for the purpose;*
15	*Planned Action Implementation Risks*		*The inability of the educational institutions MOICI and MOHERST to take part in the survey exercise for reasons of resources and or capacity.*
16	*Planned Action Monitoring and Evaluation Indicators*		*At least 95% of the stakeholders to be fully covered by the survey*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*		➢ *ICT Agency, MOICI and MOHERST, Educational institutions and GBOS*

13.2.4 Reviewing and developing institutional policies and strategies in relation to TEE		
No	***Parameter***	***Remark/Comment***
1	*Planned Action Type*	*Policy and Process related*
2	*Background to Planned action*	*The global trend is for countries to reposition their educational institutions for TEE adoption and utilisation. The Covid-19 crisis has provided a more compelling reason for such an exercise.*
3	*Description of Planned Action*	*There will be a review process of the local policies and current strategies of the educational institutions in relation to TEE. This would involve the identification of the parameters for review and the number of institutions for the conduct of the review based on consultation.*
4	*Planned Action Implementation Rationale*	*Having a clarity of approach on the policy needs to the advancement of TEE and its adoption by the concerned stakeholders.*
5	*Planned Action Specific Goals/Objective*	*a) Auditing and evaluating the status and existing resources and infrastructure including hardware and software within the institutions in relation to TEE and the digital infrastructure that is available for TEE.* *b) Examining the utilization of the resources for TEE;* *c) Establish the available standards and fitness of the digital infrastructure available for TEE;* *d) Developing the institutional stakeholders in preparation for and during the implementation of TEE.* *e) Recognizing and registering the stakeholders for TEE growth and development;* *f) Preparing and defining the materials and resources with the guidelines for the adoption of TEE standards;* *g) Setting up the organizational framework for stakeholders within the TEE ecosystem;* *h) Identifying the key institutions and staff*

			with interest in TEE development;
			i) *Creating a database of the materials and resources;*
6	*Planned Action Implementation Prerequisites*		a) *Identifying the institutions;*
			b) *Preparing the parameters for review;*
			c) *All stakeholders to be prepared and made ready for the conduct of the review;*
7	*Planned Action Time Frame*		*1st Year of Implementation – by Q1 of 2021*
8	*Planned Action Deliverables*		a) *A report on the review;*
			b) *Having an established baseline for drafting the institutional policies and strategies;*
9	*Time Bound Measurable Targets*		*Key identified academic staff are engaged in the review of TEE materials and resources.*
10	*Implementing Agency*		*MoHERST and ICT Agency*
11	*Planned Action Outputs*		*A conducive environment for the implementation of the TEE ecosystem in The Gambia*
12	*Anticipated Beneficiaries*		*The Students, educational institutions and Government*
13	*Resource Mobilisation and Costing*		*Government allocation and universal service funding as well as having 1% of GDP as per AU Target*
14	*Planned Action Critical Success Factors*		a) *Full participation of the educational institutions;*
			b) *Sufficient funding for the review;*
			c) *Focussed review exercise;*
15	*Planned Action Implementation Risks*		*The inability of the educational institutions and the concerned ministries to jointly own the review process for reasons of resources and or capacity.*
16	*Planned Action Monitoring and Evaluation Indicators*		a) *Having Policies covering:*
			b) *Infrastructure and technical support*
			c) *Student assessment;*
			d) *Developing students' digital literacy;*
			e) *The professional development of academic staff;*
			a) *Advancing and rewarding scholarly activities relating to TEE;*
			b) *Sharing TEE scholarship activities;*

		c) The sharing of TEE activities;
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➤ *ICT Agency, MOICI and MOHERST, Educational institutions*

13.2.5 Having a comprehensive national governance framework for TEE

No	Parameter	Remark/Comment
1	Planned Action Type	Policy related
2	Background to Planned action	For reasons of its importance, there would be a need to put in place a governance framework for TEE adoption in The Gambia
3	Description of Planned Action	To consider and identify a framework with institutions to oversee the adoption of TEE in The Gambia.
4	Planned Action Implementation Rationale	To have an effective adoption and utilisation of TEE for the stakeholders in The Gambia.
5	Planned Action Specific Goals/Objective	a) Identifying the membership of the governance framework; b) Having a recognition of the governance framework;
6	Planned Action Implementation Prerequisites	A policy to provide the governance framework the legitimacy
7	Planned Action Time Frame	1st Year of Implementation – by Q1 of 2021
8	Planned Action Deliverables	A set up to run TEE matters with the ICT Agency in the centre of things.
9	Time Bound Measurable Targets	The ICT Agency, MOICI and MOHERST and educational institutions having agreed identified roles for the TEE.
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	An active participation of all stakeholders in the development and adoption of TEE in The Gambia.
12	Anticipated Beneficiaries	The Students, educational institutions and Government
13	Resource Mobilisation and Costing	Government allocation and universal service funding as well as having 1% of GDP as per AU Target
14	Planned Action Critical Success Factors	The cooperation and acceptance of the framework ad its workings by all stakeholders.
15	Planned Action Implementation Risks	The shifting of the Government focus for ensuring effectiveness of the governance framework.

16	*Planned Action Monitoring and Evaluation Indicators*	a) *Having identified members of the governance framework;*
		b) *Clear rules of engagement for the workings for the governance group/framework;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *ICT Agency, MICI and MOHERST and Educational institutions*

No	Parameter	Remark/Comment
	*13.2.6 Scrutiny Committee for TEE Initiatives*	
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*A Scrutiny Committee, with membership of professionals in the academia, is to be established for the purpose of conducting an in-depth review of TEE and any related issue that affects TEE adoption.*
3	*Description of Planned Action*	*It is to identify members on terms with responsibility for providing professional advice to the MoHERST and ICT Agency on matters relating to TEE development.*
4	*Planned Action Implementation Rationale*	*Preparing the MoHERST and ICT Agency with certitude in its responsiveness to the needs of TEE in The Gambia.*
5	*Planned Action Specific Goals/Objective*	*Establishing the terms of engagement of the scrutiny committee;*
6	*Planned Action Implementation Prerequisites*	*a) Identified the understanding of the membership of this scrutiny committee;* *b) Determined terms of reference for the Scrutiny Committee.*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q1 of 2021*
8	*Planned Action Deliverables*	*A clear level of the key institutions' familiarity with the works of the ICT Agency on TEE;*
9	*Time Bound Measurable Targets*	*A working scrutiny committee with members drawn from educational institutions that are active with TEE adoption.*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*Having created ownership of both the policy (to be drafted) and this strategy and the recognition of the governance framework.*
12	*Anticipated Beneficiaries*	*The Students, educational institutions and Government*
13	*Resource Mobilisation and Costing*	*Government allocation and universal service funding as well as having 1% of GDP as per AU Target*
14	*Planned Action Critical Success Factors*	*a) Commitment by the MoHERST and ICT Agency;* *b) Availability of qualified and credible individuals within the academia;*

15	*Planned Action Implementation Risks*	*The shifting of the Government focus for ensuring effectiveness of the governance framework.*
16	*Planned Action Monitoring and Evaluation Indicators*	*The scrutiny committee having played roles in the conduct of the review and development of the local policies and strategies of the educational institutions for the purposes of TEE;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *ICT Agency, MOICI and MOHERST, Educational institutions*

	13.2.7 Developing Shared Understandings and Use of TEE Terminology	
No	*Parameter*	*Remark/Comment*
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*The stakeholders need to have a common understanding of TEE and what it takes to utilize it. The process of applying ICTs to education (teaching and learning activities) with the objective of enhancing and enabling education requires a shared understanding of the concept and its use.*
3	*Description of Planned Action*	*The concerned Government ministries and educational institutions would be engaged in order to develop and share a common understandings of what TEE entails.*
4	*Planned Action Implementation Rationale*	*To have a raised optimal utilization of TEE by all stakeholders.*
5	*Planned Action Specific Goals/Objective*	*a) Developing a scholarly approach to Technology-Enabled Learning.* *b) Institutional activities aimed at raising awareness of TEE and its potential effects.*
6	*Planned Action Implementation Prerequisites*	*A proper engagement plan in relation to the sharing and use of TEE*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q2 of 2021*
8	*Planned Action Deliverables*	*Consistency in terms of approach and expectations from TEE.*
9	*Time Bound Measurable Targets*	*100% of the educational institutions have acquired the common understanding of TEE by the 3rd ear of the implementation of this strategy.*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*a) Having valued scholarly approaches to Technology-Enabled Learning.* *b) Having evidence of scholarly approaches to Technology-Enabled Learning.*
12	*Anticipated Beneficiaries*	*The students, educational institutions and the Government*
13	*Resource Mobilisation and*	*Government allocation and universal service funding as well as having 1% of GDP as per AU Target*

		Costing	
14	*Planned Action Critical Success Factors*	a) *Commitment by the MoHERST and ICT Agency;*
		b) *A quality delivery of the sharing of the understanding and use of the terminology;*
15	*Planned Action Implementation Risks*	*Having full stakeholder participation*
16	*Planned Action Monitoring and Evaluation Indicators*	a) *100% of the educational institutions utilising the adopted terminology for TEE;*
		b) *The university and college students to have the same understanding of the terminology;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➤ *ICT Agency, MOICI and MOHERST Educational institutions*

No	Parameter	Remark/Comment
	13.2.8 Encourage the Use of External Resources for TEE Teaching and Learning	
1	*Planned Action Type*	*Infrastructure related*
2	*Background to Planned action*	*For the required adoption and advancement of TEE, countries encourage the use of free Open Educational Resources (OER) or Digitized materials by educators, students and self-learners.*
3	*Description of Planned Action*	*The online OER materials would have to be identified and recognised by the Government and educational institutions for use by students.*
4	*Planned Action Implementation Rationale*	*To enhance teaching, learning and research by the use of OER.*
5	*Planned Action Specific Goals/Objective*	*Exploring the use of OER within the educational Institution.*
6	*Planned Action Implementation Prerequisites*	*a) Having in place a policy for the use of OER;* *b) Efficient broadband connectivity for educational institutions for the required access;*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q3 of 2021*
8	*Planned Action Deliverables*	*A clear framework for using OER.*
9	*Time Bound Measurable Targets*	*a) All available and relevant OER identified for the purposes of the educational institutions;* *b) Aligning the strategies of the educational institutions in the use of the OERs with the national policy statement on OER usage;*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*Having easy access to OERs for the facilitation of TEE adoption.*
12	*Anticipated Beneficiaries*	*The students, educational institutions and the Government*
13	*Resource Mobilisation and Costing*	*Government allocation and universal service funding as well as having 1% of GDP as per AU Target*
14	*Planned Action Critical Success*	*a) Having a plan for OER use and communicating the plan to the key stakeholder;*

	Factors	*b) The acceptance and utilization of the plan;*
		c) A condition for educational institutions to have OERs within their curriculum;
		d) Having the right capacity for the use of the OERs.
15	*Planned Action Implementation Risks*	*Educational institutions failing to recognise the use of OERs.*
16	*Planned Action Monitoring and Evaluation Indicators*	*a) 100% of the educational institutions utilising OER;* *b) Not less that 50% of the students using and working for these external resources.* *c) Having a plan for the students' use of the resources;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *ICT Agency, MOICI and MOHERST, Educational institutions*

No	Parameter	Remark/Comment
...	

13.2.9 Outline Measures for Improving STI Readiness in The Gambia

No	Parameter	Remark/Comment
1	Planned Action Type	Policy and Infrastructure related
2	Background to Planned action	As part of the best practice, there is a need to have an outline of measures for improving STI readiness in The Gambia in terms of infrastructure more specifically the access to broadband, e-Government platforms, reliable electricity and good transport networks.
3	Description of Planned Action	There will be an assessment of the prerequisites for STI and establish the current standing of The Gambia in terms of STIs.
4	Planned Action Implementation Rationale	It is to establish the country's readiness for other measures especially those within this strategy.
5	Planned Action Specific Goals/Objective	a) Reassessing the gaps in STI Development; b) Review of access terms and usage of infrastructure including broadband;
6	Planned Action Implementation Prerequisites	a) Having a specific review and reassessment plan; b) The review exercise must be participatory; c) All stakeholders must be involved;
7	Planned Action Time Frame	1st Year of Implementation – by Q1 of 2021
8	Planned Action Deliverables	Report on the STI readiness of The Gambia
9	Time Bound Measurable Targets	An assessed level of preparedness of the concerned Ministries, ICT Agency, universities, colleges and educational institutions for STI (as stakeholders)
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	Having prepared a baseline for STI policy development.
12	Anticipated Beneficiaries	MoHERST, MOICI, ICT Agency, universities, colleges and educational institutions
13	Resource Mobilisation and Costing	Government allocation and universal service funding as well as having 1% of GDP as per AU Target
14	Planned Action Critical Success Factors	Ensuring that the policy outlines measures through which transportation and electricity networks compliments STI;
15	Planned Action Implementation	Educational institutions failing to take part in the process.

		Risks	
16	*Planned Action Monitoring and Evaluation Indicators*	*Each stakeholder having been given a score level on its level of preparedness.*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➤ *ICT Agency, MOICI and educational institutions*

No	Parameter	Remark/Comment
	13.2.10	**Identifying the Sources of Funding for STI Development**
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*All STI projects and programmes can be very expensive. The R&D component for innovation can require resources hence the need for serious forms of funding.*
3	*Description of Planned Action*	*The Government would have to come up with measures for determining the sources of funding the STI projects. This has national and regional dimension.*
4	*Planned Action Implementation Rationale*	*To have a sustainable development of STI in the country through reliable funding.*
5	*Planned Action Specific Goals/Objective*	*a) Identifying the stakeholder-beneficiaries eligible for funding in a given year and as per the national R&D plan;* *b) Government allocating 1% of GDP for R&D;* *c) Securing understanding with key development partners for funding;*
6	*Planned Action Implementation Prerequisites*	*a) A declared policy position on the funding;* *b) Government to adopt the AU 1% of the GDP Target for funding R&D:*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q1 of 2021*
8	*Planned Action Deliverables*	*An approved funding framework for STI.*
9	*Time Bound Measurable Targets*	*A consideration of funding by the executive and the National Assembly for STI.*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*A conducive environment for R&D and STI growth.*
12	*Anticipated Beneficiaries*	*The Government, businesses and research organisations*
13	*Resource Mobilisation and Costing*	*Government allocation and universal service funding as well as having 1% of GDP as per AU Target*
14	*Planned Action Critical Success Factors*	*Government commitment to compliance with the AU 1% GDP Target*

15	*Planned Action Implementation Risks*	*The inability of ICT Agency to push for Government's allocation and approval of funding for STI.*
16	*Planned Action Monitoring and Evaluation Indicators*	*a) A budgetary allocation for STI projects;* *b) Identified and defined STI projects with approved funding and sources of funding;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *ICT Agency, MOICI and Government;*

No	Parameter	Remark/Comment
	13.2.11 Determination of Incentives for STI Development with the Private Sector	
No	*Parameter*	*Remark/Comment*
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*There is the practice of the use of fiscal incentives, such as tax exemptions, rebates, reliefs, holidays, and accelerated depreciations for promoting R & D, linkages with industry, application of ICTs, training, etc. Countries with effective incentive regimes for STI have progressive research results and innovation. There are other forms of incentives like budgetary, legal, regulatory and honorific incentives.*
3	*Description of Planned Action*	*Preparing the right policy framework with actions for for determining an incentive scheme for STI.*
4	*Planned Action Implementation Rationale*	*To have the effective tools for managing technological change and innovation vital for the country's socio-economic development.*
5	*Planned Action Specific Goals/Objective*	*a) Having an annual incentive plan for STI;* *b) Government entering into an MoU with the MOICI, MoHERST and Agency in relation to the incentives;*
6	*Planned Action Implementation Prerequisites*	*a) A policy* *b) Supporting law* *c) Government commitment*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q3 of 2021*
8	*Planned Action Deliverables*	*An approved incentive scheme for STI*
9	*Time Bound Measurable Targets*	*a) Specific regulations addressing incentives;* *b) Outlined incentives for STI;*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*a) Efficiency on STI development;* *b) Conducive enviroment for R&D;*
12	*Anticipated Beneficiaries*	*The educational institutions, citizens, businesses and the Government*
13	*Resource Mobilisation and Costing*	*Government commitment to compliance with the AU 1% GDP Target*
14	*Planned Action*	*a) Governmet commitment towaqrds R&D;*

	Critical Success Factors	*b) A policy with measures for incentives;*
15	*Planned Action Implementation Risks*	*Policy shift in terms of priorities with impact on the incentives*
16	*Planned Action Monitoring and Evaluation Indicators*	*a) At least 40% of the needed funding for R&D to be through the incentive scheme;* *b) Incentive zones like fiscal incentives, budgetary incentives, legal incentives, regulatory incentives and honorific incentives being defined with assigned STI activities*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *The Government (MOICI and MOHERST, National Assembly) and educational institutions.*

13.2.12   *Strengthen the National Assembly in Innovation Policy Making for STI*

No	Parameter	Remark/Comment
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*The national assembly with control and influence on government budget must be involved in the STI development in The Gambia. There would be the need for a number of measures that would require the attention and approval of the National Assembly.*
3	*Description of Planned Action*	*There would be policy making actions, legislative amendments for STI (be it incentives or the protection of research works) for the advancement of measures promoting STI.*
4	*Planned Action Implementation Rationale*	*Effective in the implementation of the strategic objectives defined by this Strategic plan.*
5	*Planned Action Specific Goals/Objective*	*a) By establishing a specific national assembly committee for science and innovation and to serve as an overseer for the implementation of the innovation policy;* *b) By establishing a STI research and policy analysis support mechanism for the National Assembly as a whole. The objective is to improve the country's innovative capacities through various policy and legislative reforms.*
6	*Planned Action Implementation Prerequisites*	*a) An aligned policy on STI with AU-STISA-2024;* *b) The commitment of the national Assembly towards science, technology and innovation for the country;* *c) A Government with special focus on STI for the country's development;*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q1 of 2021*
8	*Planned Action Deliverables*	*An effective involvement of the national assembly in STI development.*
9	*Time Bound Measurable Targets*	*a) Having the National Assembly as the overseer for STI (R&D);* *b) A standard understanding for the running of the STI research and policy analysis support mechanism and that of the Scrutiny Committee;*

10	*Implementing Agency*	*MoHERST, ICT Agency and the National Assembly*
11	*Planned Action Outputs*	*Exemplary commitment of the country to science, technology and innovation and more specifically research.*
12	*Anticipated Beneficiaries*	*The concerned ministries, ICT Agency, the Executive and the National Assembly*
13	*Resource Mobilisation and Costing*	*Government commitment to compliance with the AU 1% GDP Target*
14	*Planned Action Critical Success Factors*	*a) Government commitment;* *b) Acceptance by the national Assembly to have a role in STI*
15	*Planned Action Implementation Risks*	*A failure of the government to push for aalignment with the AU-STISA-2024 policy and or relevant legislative amendments for a role for any concerned stakeholder.*
16	*Planned Action Monitoring and Evaluation Indicators*	*a) Outlines standards or measures to be taken by the National Assembly for STI through the ICT Agency;* *b) A clear framework for research works and their benefits for the country;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	*➢ The MOICI and MOHERST, ICT Agency, the Executive and the National Assembly*

13.2.13 Enhancing the Mandate of ICT Agency to Complement Implementing the STI Strategy

No	Parameter	Remark/Comment
1	Planned Action Type	Policy related
2	Background to Planned action	All STI strategies are usually implemented by an organ of the Government and more preferably agencies. The ICT Agency has to be recognised for it to have a role in the implementation this strategy and facilitate the alignment of a policy for STI with that of AU STISA-2024.
3	Description of Planned Action	The ICT Agency would be prepared to be part of the implementation of the objectives outlined by this strategy. A policy on STI could elaborate the better details of this engagement.
4	Planned Action Implementation Rationale	A clear governance framework for the strategy and ensuring accountability for all endeavours towards the development of STI.
5	Planned Action Specific Goals/Objective	a) Spearhead the alignment implementation of the STI policy; b) Promote and nurture university–industry research and technology development partnerships, as well as industry partnerships; c) The establishment of a framework for the STI Council's relation with the ICT Agency and that of the national Assembly's committee;
6	Planned Action Implementation Prerequisites	Having ICT Agency as the additional adopted entity for STI development;
7	Planned Action Time Frame	To be accomplished before Q1 of 1st Year of Implementation –2021;
8	Planned Action Deliverables	a) An adopted position of ICT Agency to implement the terms of this strategy for TEE and STI;

		b) Acquiring an established head office for the Agency to facilitate the implementation of this strategy;
		c) Develop Human Resource Policies and Procedures Manual for the ICT Agency to facilitate the implementation of this strategy;
9	*Time Bound Measurable Targets*	*Government MoU with the ICT Agency and other relevant entities for the implementation of the terms of this strategy;*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*A clear framework for the implementation of this strategy and ensure compliance with The Gambia's commitment at the level of the AU on STI and its related developments.*
12	*Anticipated Beneficiaries*	*The Government including MOICI and citizens.*
13	*Resource Mobilisation and Costing*	*Government commitment to compliance with the AU 1% GDP Target.*
14	*Planned Action Critical Success Factors*	a) Commitment of the government for the success of the implementation; b) Effective leadership to push for the policy and mandate; c) Policy clarity on the role of all stakeholders;
15	*Planned Action Implementation Risks*	*Policy change on priorities;*
16	*Planned Action Monitoring and Evaluation Indicators*	a) An enhanced ICT Agency for the implementation of this strategy for STI; b) A framework for the promotion of knowledge and technology transfer from laboratories to businesses; c) Appropriate funding mechanisms or instruments for innovation in public and private enterprises;

17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *Government including MOICI ,MoHERST and ICT Agency*

No	Parameter	Remark/Comment
	13.2.14 **Develop the Private Sector and Promote Innovation in Businesses for STI**	
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*The role of the private sector in promoting science, technology and innovation even among youth and the general public is a critical issue. It is important to prepare and create a good ground for private sector to participate in the promotion of innovation.*
3	*Description of Planned Action*	*To define and prepare parameters for the private sector to take part in the development of STI especially in R&D .*
4	*Planned Action Implementation Rationale*	*To have a private-sector-led STI (R&D) in the country.*
5	*Planned Action Specific Goals/Objective*	*a) Defining a PPP framework for STI Development;* *b) Having identified the potential private sector members for STI development;*
6	*Planned Action Implementation Prerequisites*	*a) An effective engagement plan for the private sector in STI development;* *b) An approved policy that specifically promotes the participation of the private sector and youth through incentives provided herein;* *c) Support and increase skills acquisition by the youth and increase support to graduates of TVET institutions, especially the female graduates;*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q4 of 2021*
8	*Planned Action Deliverables*	*An enhanced private sector that participates in STI development.*
9	*Time Bound Measurable Targets*	*a) Executed PPP agreements for STI Development;* *b) Having an outline of projects based on public private partnership that attracts funding;*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action*	*A conducive environment for STI (R&D) that*

	Outputs	*benefits all stakeholders.*
12	*Anticipated Beneficiaries*	*The citizens, businesses and the Government*
13	*Resource Mobilisation and Costing*	*Government commitment to compliance with the AU 1% GDP Target.*
14	*Planned Action Critical Success Factors*	*a) Clear willingness on the part of the private sector members for participation in STI (R&D);* *b) Clear and attractive incentive system;*
15	*Planned Action Implementation Risks*	*Policy change for reasons of changes in priorities.*
16	*Planned Action Monitoring and Evaluation Indicators*	*a) An STI information system with national relevance;* *b) Guidelines for STI Indicators;* *c) Indicators for R&D in terms of human resources and technology;* *d) Patent indicators;* *e) Bibliometric indicators;* *f) Strengthened healthcare services and delivery systems;* *g) Health Management Information System (HMIS);*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	*➢ The Government, ICT Agency and Research institutions*

13.2.15		Having Clear Framework for International Cooperation & Collaboration for STI	
No	**Parameter**	**Remark/Comment**
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*The general objectives of that The Gambia can look out for in international cooperation are to create and enhance the country's attractiveness in research and innovation as well as its industrial and economic competitiveness. As globalisation pose a challenge and an opportunity to all countries, The Gambia must be ready to address the challenges and turn the opportunities to its advantage.*
3	*Description of Planned Action*	*Preparing a framework for engagement at the regional and international level on matters for STI.*
4	*Planned Action Implementation Rationale*	*It is to increase cooperation and exchange of experience on STI and R&D*
5	*Planned Action Specific Goals/Objective*	*a) Identifying the partners for international cooperation;* *b) Assessing possibilities within the European Union–Africa Joint Strategy;* *c) Considering the India–Africa Science and Technology Initiatives for cooperation;* *d) Looking into China–Africa Science and Technology Partnership for any possible cooperation;*
6	*Planned Action Implementation Prerequisites*	*a) Have an alignment of the policy on STI;* *b) Identify the international bilateral STI agreements that may be beneficial to The Gambia;* *c) Take a lead role in the implementation of the AU STISA-2024 Strategy;*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q4 of 2021*
8	*Planned Action Deliverables*	*Improved economies of scale STI (R&D)*
	Time Bound	*a) Improved changes in the country's R&D*

9	Measurable Targets	funding; b) Easy access path to research infrastructure; c) Facilitated human capital development; d) Enhanced reputation for The Gambia in research within the region; e) Boosted innovative sector with full participation by the private sector and the academia;
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	Beneficial engagement at the national and international level for STI development.
12	Anticipated Beneficiaries	The Government, MoHERST, ICT Agency, Businesses and Research organisations
13	Resource Mobilisation and Costing	Government commitment to compliance with the AU 1% GDP Target.
14	Planned Action Critical Success Factors	Strong Government commitment
15	Planned Action Implementation Risks	Policy shift and or change
16	Planned Action Monitoring and Evaluation Indicators	a) Compliance with AU STISA-2024 conditions; b) Specific legislative amendments for the protection of research works or STI; c) MoUs for cooperation and collaboration;
17	Planned Action Implementation monitoring and Evaluation Responsibility	➢ The Government, MoHERST, ICT Agency, Businesses and Research organisations

No	Parameter	Remark/Comment
	13.2.16	**Build Skills and Entrepreneurial Culture to Meet Market Demand for STI**
1	Planned Action Type	Policy related
2	Background to Planned action	With the technology changes and globalisation, STI and entrepreneurship also centre on the need to have new creative solutions to address the daily challenges with the right resources including human resources. With the changes, there are new ways of thinking, working, and solving problems all calling for new types of innovators, entrepreneurs, and intrapreneurs among others to facilitate change. At the heart of all is the need to have the relevant skills and competences. It is important to have a plan to meet the market demand for STI.
3	Description of Planned Action	To prepare and engage in the human resources development for the needs of STI especially in R&D.
4	Planned Action Implementation Rationale	Building the right skills is about both educating internally and researcher mobility with measures to enhance exposure to other research environments and approaches. Building the right entrepreneurial culture is a useful way to promote R&D, and indirectly increases the quality and quantity of human capital. This is particularly relevant for The Gambia with a less developed STI system and a smaller human capital stock.
5	Planned Action Specific Goals/Objective	a) Identify the skills for STI Development; b) Carry out a market survey on the needs for innovation, research and development;
6	Planned Action Implementation Prerequisites	a) Having an assessment report on the skills gap for STI especially in R&D; b) A reviewed Policy must specifically address the typical skills for STI development;
7	Planned Action Time Frame	1st Year of Implementation – by Q1 of 2022
8	Planned Action Deliverables	Adequacy in the set of skills to meet the demands of STI (R&D)
9	Time Bound	a) Identified set of skills that are to be promoted by the government;

	Measurable Targets	*b) Outlined incentives to encourage capacity building around those set of skills;*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*A sustainable STI ecosystem that is endowed with skilled human resources for R&D.*
12	*Anticipated Beneficiaries*	*The citizens, businesses and the Government*
13	*Resource Mobilisation and Costing*	*Government commitment to compliance with the AU 1% GDP Target.*
14	*Planned Action Critical Success Factors*	*a) A plan for skills identification and training;* *b) Availability of adequate funding;* *c) Active participation of the private sector in the skills development;*
15	*Planned Action Implementation Risks*	*a) Change in Government's policy priority;* *b) Lack of trainable personnel;*
16	*Planned Action Monitoring and Evaluation Indicators*	*a) Indicators for skills and capacity building for STI;* *b) Adopted manual for research and development;* *c) Special MoU between the MoHERST, ICT Agency and the University of The Gambia for ICT R&D that enhances STI development;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *The Government, MoHERST and ICT Agency*

13.2.17   Government Application of 1% of GDP for research and development for STI

No	Parameter	Remark/Comment
1	Planned Action Type	Policy related
2	Background to Planned action	The general AU membership encourages members to allocate 1% of their GDP for research and development as in STI. The AU's STISA-2024 outlines some strategic measures.
3	Description of Planned Action	The Government through the National Assembly to allocate 1% of the GDP for R&D in innovations pertaining to STI.
4	Planned Action Implementation Rationale	To provide adequate funding for ICT related research and development in relation to STI and the enhancement of the environment for research with possibility of enhancing on economic growth.
5	Planned Action Specific Goals/Objective	Making sure that there is determination by the Government through the national budget for 1% of the GDP to be allocated for STI (R&D) innovations;
6	Planned Action Implementation Prerequisites	Clear policy and legislative amendments to ensure more legitimacy.
7	Planned Action Time Frame	Before Q1 of the 1st Year of Implementation 2021
8	Planned Action Deliverables	A reliable and adequate funding for STI (R&D)
9	Time Bound Measurable Targets	a) The executive arm of the Government and the National Assembly considered measures for the allocation; b) A reviewed and aligned policy that caters for the allocation; c) Possible legislative amendments for the purpose;
10	Implementing Agency	MoHERST, ICT Agency / MOICI
11	Planned Action Outputs	Certitude for research and development especially for STI
12	Anticipated Beneficiaries	The ICT Agency, research institutions/organisations, citizens and the Government
13	Resource	Government commitment to compliance with the AU

		Mobilisation and Costing	*1% GDP Target.*
14		*Planned Action Critical Success Factors*	a) *Support of the executive arm of the Government;* b) *The National Assembly support;*
15		*Planned Action Implementation Risks*	*Policy change for reasons of changes in government priorities;*
16		*Planned Action Monitoring and Evaluation Indicators*	a) *An estimate of the funds allocated for R&D;* b) *Identified areas for R&D with allocations;*
17		*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *The ICT Agency, research institutions/organisations, and the Government.*

13.2.18   Create Awareness for Research and Innovation

No	Parameter	Remark/Comment
1	Planned Action Type	Policy related
2	Background to Planned action	With the technology changes and globalisation, there is a need to create awareness for research and innovation. This brings about positive inclusion on the part of many stakeholders for their involvement in the process of research and innovation.
3	Description of Planned Action	To prepare and engage awareness exercise for research and innovation in relation to STI especially in R&D.
4	Planned Action Implementation Rationale	The awareness campaign is particularly relevant for The Gambia with a less developed STI system and a smaller human capital stock that could be involved in research.
5	Planned Action Specific Goals/Objective	a) Preparing a comprehensive framework; b) Putting in place the required standards and guidelines; c) Database on R&D activities; d) Establish NaRDC - set up; e) Developed R&D SOPs for fund management;
6	Planned Action Implementation Prerequisites	Having an identification of areas of research that has value for the economic development of the country in relation to STI;
7	Planned Action Time Frame	1st Year of Implementation – by Q2 of 2022
8	Planned Action Deliverables	An environment with credible research work with measured benefits for the country;
9	Time Bound Measurable Targets	a) Identified set of research areas that are to be promoted by the government; b) Outlined incentives to encourage research areas;
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	A sustainable STI ecosystem with a research environment that that attracts researchers with renown credibility;
12	Anticipated Beneficiaries	The citizens, businesses and the Government
13	Resource Mobilisation and Costing	Government commitment to compliance with the AU 1% GDP Target.
14	Planned Action	a) A plan for awareness campaign;

	Critical Success Factors	b) *Availability of adequate funding;* c) *Active participation of the private sector in the research initiation;*
15	*Planned Action Implementation Risks*	a) *Change in Government's policy priority;* b) *Change in the mandate of the ICT agency;*
16	*Planned Action Monitoring and Evaluation Indicators*	a) *Indicators for research works;* b) *Adopted manual for research and development;* c) *Database on R&D activities* d) *Establish NaRDC* e) *Increase STI-related R&D funding* f) *Developed R&D uniform SOPs for fund management;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *The Government, Academia and ICT Agency*

13.2.19   Legislative Determination of Regulatory Framework for STI Development

No	Parameter	Remark/Comment
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*It is important to inject legitimacy into measures for the development of STI. This could be done through legislations and or legislative reviews as well as determining the right regulatory frameworks for STI.*
3	*Description of Planned Action*	*To carry out reviews of the applicable legislations and or regulations for matters pertaining to STI.*
4	*Planned Action Implementation Rationale*	*To have STI strategies clothed with a degree of legitimacy. This will bred certitude for all stakeholders.*
5	*Planned Action Specific Goals/Objective*	*a) Carrying out a review of intellectual property rights (IPR) system;* *b) Carrying out a review of relevant regulations and develop relevant standards and guidelines for STI;* *c) Preparing and having a register of institutions for R&D;*
6	*Planned Action Implementation Prerequisites*	*Careful review works to determine the challenges for the STI development and possibilities for amendments.*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q1 of 2021*
8	*Planned Action Deliverables*	*Efficient legislative and regulatory framework for STI*
9	*Time Bound Measurable Targets*	*Identified legislative amendments or regulations for STI development;*
10	*Implementing Agency*	*MoHERST and ICT Agency*
11	*Planned Action Outputs*	*A recognized and sustainable regulatory framework for STI development.*
12	*Anticipated Beneficiaries*	*The citizens, businesses and the Government*
13	*Resource Mobilisation and Costing*	*Government commitment to compliance with the AU 1% GDP Target.*
14	*Planned Action*	*a) Commitment of the government and adequate*

	Critical Success Factors	*capacity on the part of the ICT Agency to carry out the review;* b) *Active participation of the private sector in the review;*
15	*Planned Action Implementation Risks*	*Change in Government's policy priority;*
16	*Planned Action Monitoring and Evaluation Indicators*	a) *Review of related legal and regulatory framework for STI;* b) *A list of legislations and regulations for STI;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *MoHERST and ICT Agency*

No	Parameter	Remark/Comment
13.2.20 Developed and Implemented National Research Agenda	

No	Parameter	Remark/Comment
1	*Planned Action Type*	*Policy related*
2	*Background to Planned action*	*With the technology changes and globalisation, STI and entrepreneurship also centre on the need to have new creative solutions to address the daily challenges with the right resources including human resources. With the changes, there are new ways of thinking, working, and solving problems all calling for new types of innovators, entrepreneurs, and intrapreneurs among others to facilitate change. At the heart of all is the need to have the relevant skills and competences. It is important to have a plan to meet the market demand for STI.*
3	*Description of Planned Action*	*To prepare and engage in the human resources development for the needs of STI especially in R&D.*
4	*Planned Action Implementation Rationale*	*Building the right skills is about both educating internally and researcher mobility with measures to enhance exposure to other research environments and approaches. Building the right entrepreneurial culture is a useful way to promote R&D, and indirectly increases the quality and quantity of human capital. This is particularly relevant for The Gambia with a less developed STI system and a smaller human capital stock.*
5	*Planned Action Specific Goals/Objective*	*a) Identifying the research agendas and the concerned institutions for R&D;* *b) Approving and publishing the national research agenda for a given year;*
6	*Planned Action Implementation Prerequisites*	*a) A plan for identifying research agendas;* *b) The involvement of the research organisations/institutions;* *c) Specifically identified typical research areas for STI development;*
7	*Planned Action Time Frame*	*1st Year of Implementation – by Q1 of 2022*
8	*Planned Action Deliverables*	*A research agenda for the country based on the broader objectives of the NDP*
9	*Time Bound*	*Identified set of research areas that are to be*

	Measurable Targets	promoted by the government;
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	Certitude in the path to research for enhanced funding.
12	Anticipated Beneficiaries	The academia, citizens, businesses and the Government
13	Resource Mobilisation and Costing	Government commitment to compliance with the AU 1% GDP Target.
14	Planned Action Critical Success Factors	a) A plan for research needs; b) Availability of adequate funding for each component of research activity on the agenda; c) Active participation of the private sector;
15	Planned Action Implementation Risks	a) Change in Government's policy priority; b) Lack of capacity on the part of the ICT agency to identify the research needs;
16	Planned Action Monitoring and Evaluation Indicators	a) Indicators for research areas for STI; b) Adopted manual for research and development; c) Special MoU between the MoHERST, ICT Agency and the University of The Gambia in relation to the research agenda;
17	Planned Action Implementation monitoring and Evaluation Responsibility	➢ MoHERST, ICT Agency and University of The Gambia

13.2.21 A Framework for Research, Accreditation and Quality Assurance

No	Parameter	Remark/Comment
1	Planned Action Type	Policy related
2	Background to Planned action	There is NAQAA as a regulatory body that delivers accreditation services. It is to ensure continuous quality improvement and efficient performance of Gambian tertiary and higher education institutions in terms of their systems and programmes. So with the right regulatory framework, there would be a need to address the critical issue of quality in research and their accreditation.
3	Description of Planned Action	To prepare and develop a clear framework for research, accreditation and quality assurance in relation to R&D.
4	Planned Action Implementation Rationale	Having quality research with expected positive impacts for the stakeholders and the general economy.
5	Planned Action Specific Goals/Objective	a) Preparing the framework; b) Putting in place the required standards and guidelines;
6	Planned Action Implementation Prerequisites	a) An alignment of STI Policy with AU-STISA-2024; b) Approved regulations for research quality and accreditation;
7	Planned Action Time Frame	1st Year of Implementation – by Q3 of 2022
8	Planned Action Deliverables	Creating value for and in research works;
9	Time Bound Measurable Targets	a) Unique guidelines for Research work; b) A clear accreditation and quality assurance framework;
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	A credible and sustainable STI ecosystem for R&D
12	Anticipated Beneficiaries	The citizens, businesses and the Government
13	Resource Mobilisation and Costing	Government commitment to compliance with the AU 1% GDP Target.
14	Planned Action Critical Success Factors	A clear regulatory framework for research and development

15	*Planned Action Implementation Risks*	a) *Change in Government's policy priority;* b) *A compromise in having quality accreditation and quality assurance measures in relation to R&D*
16	*Planned Action Monitoring and Evaluation Indicators*	*Indicators for accreditation and quality assurance guidelines;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *MoHERST and ICT Agency*

13.2.22   A Licensing Framework for Research Projects for STI

No	Parameter	Remark/Comment
1	Planned Action Type	Policy related
2	Background to Planned action	With globalisation and changes in technology, the recent trends in technology licensing indicate that technology licensing is encouraged in order to reposition a country and its businesses in their global product strategy. The value in R&D resulting in innovation is intrinsically linked to the value in licensing of products.
3	Description of Planned Action	To prepare a licensing framework for Research projects.
4	Planned Action Implementation Rationale	Protection of value in a research work for the benefit of the researchers or funders of the research work.
5	Planned Action Specific Goals/Objective	a) Drafting and having approved licensing regulations for research projects; b) Preparing a comprehensive monitoring and evaluation framework for research programmes;
6	Planned Action Implementation Prerequisites	a) A reviewed and aligned policy; b) A relevant legislation including an amendment to the IP Law for the licensing;
7	Planned Action Time Frame	1st Year of Implementation – by Q4 of 2022
8	Planned Action Deliverables	Adequate licensing regime for research work
9	Time Bound Measurable Targets	a) Clear measures in place for the licensing of research works; b) An established regulator with capacity to initiate the licensing process;
10	Implementing Agency	MoHERST and ICT Agency
11	Planned Action Outputs	An environment with protective measures for research and intellectual property;
12	Anticipated Beneficiaries	The citizens, businesses and the Government
13	Resource Mobilisation and Costing	Government commitment to compliance with the AU 1% GDP Target.
14	Planned Action Critical Success Factors	An approved licensing framework for research works;

15	*Planned Action Implementation Risks*	*Change in Government's policy priority;*
16	*Planned Action Monitoring and Evaluation Indicators*	a) *Having enforceable licensing regulations or guidelines;* b) *A regulator in charge of the licensing matters;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	➢ *MoHERST and ICT Agency*

13.3 Risk Management

No	Parameter	Remark/Comment
TEE and STI Risks Management and Mitigation Strategies	
1	*Planned Action Type*	*Policy – mitigating risks*
2	*Background to Planned action*	*There are risks for the implementation of this strategy. To manage the risks, an outlined risk mitigation strategies are considered;*
3	*Description of Planned Action*	*Defining the activities to address the identified risks to this Plan.*
4	*Planned Action Implementation Rationale*	*To eliminate uncertainty and increase certitude in the Plan's implementation.*
5	*Planned Action Specific Goals/Objective*	*a) Government by making sure that 1% of the GDP is put aside for R&D in ICTS for TEE and STI.* *b) Raising the awareness levels amongst all key stakeholders of the need for TEE and SDTI as well as the commitment of The Gambia in relation to the AU STI Strategy-2024 must be strengthened.* *c) Preparing an advocacy plan with messages for the different stakeholder groups within TEE and STI.* *d) Integrating TEE, STI and ICT into The Gambia's development frameworks of the NDP.* *e) Using evidence-based approach of establishing comparable baselines and performance metrics for TEE and STI.*
6	*Planned Action Implementation Prerequisites*	*a) A Clear and comprehensive policy for TEE and an alignment of STI Policy with the AU-STISA-2024.* *b) Proper management and coordination for policy's implementation through an entity like the ICT Agency and MoHERST with enhanced human resources and relevant legislative and regulatory changes.* *c) Determination of incentives for TEE and*

		STI development with the private-sector.
		d) A clear framework for international cooperation and collaboration.
		e) Diversified sources of funding for TEE and STI development;
7	*Planned Action Time Frame*	*To begin by Q2 of 2021*
8	*Planned Action Deliverables*	*Successful implementation of the Plan.*
9	*Time Bound Measurable Targets*	*a) Enhanced infrastructure for TEE and STI;* *b) National budget with 1% allocation of the GDP for TEE and STI R&D;* *c) Efficient Governance framework*
10	*Implementing Agency*	*MOICI*
11	*Planned Action Outputs*	*All The Gambians have an appreciation of the potential of TEE and STI;*
12	*Anticipated Beneficiaries*	*All stakeholders*
13	*Resource Mobilisation and Costing*	*See Below*
14	*Planned Action Critical Success Factors*	*a) The commitment and support from all stakeholders;* *b) Adequate awareness campaign and communication in relation to the identified programmes in this Plan;* *c) Sufficient trust on the part of the stakeholders for implementation;*
15	*Planned Action Implementation Risks*	*The absence of enough time or funds for the implementation of a strategic agenda;*
16	*Planned Action Monitoring and Evaluation Indicators*	*Having the key risk indicators in place;*
17	*Planned Action Implementation monitoring and Evaluation Responsibility*	*MOICI and MOHERST, MOFEA*

13.4 Estimated Costs

Although not wholly exhaustive, the following cost is assigned to each activity as they are cost used in establishing the estimates in the table:

NO	ITEM	ASSIGNED COSTS IN DALASI
a)	Legislation	750,000
b)	Regulation	250,000
c)	Review process	250,000
d)	Standards (related)	600,000
e)	Guidelines	250,000
f)	Planning and evaluation (related)	400,000
g)	Simple framework (including chart)	250,000
h)	Ecosystem (related)	600,000
i)	Surveys	1,500,000

In some cases and depending on the issue and its scope the specific assigned cost is slightly altered.

13.4.1 Detail Cost Estimates

NO	OBJECTIVE	ESTIMATED COST
PART 1- TECHNOLOGY-ENABLED EDUCATION - TEE	
	CARRY OUT AN ASSESSMENT OF THE PHYSICAL NEEDS FOR TEE	
a)	Identification of the key stakeholders for TEE development;	400,000
b)	Identification of the resources needed for TEE in the country;	250,000
	Sub Total Estimate	**650,000**
	PREPARE AND ENDORSE A POLICY FOR TEE;	
a)	A policy based on the assessment report;	500,000
b)	Stakeholder consultation;	600,000
c)	Preparation of Cabinet paper for the policy;	--
	Sub Total Estimate	**1,100,000**

	A NATIONAL SURVEY ON STATUS OF TEE AND THE USE OF ICTS BY EDUCATIONAL INSTITUTIONS	
a)	Determining survey questioners;	*200,000*
b)	Engaging GBOS for the conduct of the survey;	*1,500,000*
	Sub Total Estimate	1,700,000
	REVIEWING AND DEVELOPING INSTITUTIONAL POLICIES AND STRATEGIES IN RELATION TO TEE	
a)	Auditing existing resources and infrastructure within the institutions in relation to TEE on the hardware and software and the digital infrastructure that is available for TEE.	*1,000,000*
b)	Identifying, inspecting and verifying the available resources;	250,000
c)	Examining the utilization of the resources for TEE;	200,000
d)	Evaluating the status of the available hardware and software for TEE;	200,000
e)	Establish the available standards and fitness of the digital infrastructure available for TEE;	200,000
f)	Developing the institutional stakeholders in preparation for and during the implementation of TEE.	200,000
g)	Recognizing and registering the stakeholders for TEE growth and development;	200,000
h)	Defining the guidelines for the adoption of TEE standards;	250,000
i)	Setting up the organizational framework for stakeholders within the TEE ecosystem;	250,000
j)	Identifying the key institutions and staff with interest in TEE development;	200,000
k)	Preparing and identifying the standards for the materials and resources for TEE;	600,000
l)	Creating a database of the materials and resources;	600,000
	Sub Total Estimate	**3,150,000**

	HAVING A COMPREHENSIVE NATIONAL GOVERNANCE FRAMEWORK FOR TEE		
a)	Identifying the membership of the governance framework;	*100,000*
b)	Having a recognition of the governance framework;	*500,000*
	Sub Total Estimate	**600,000**
	SCRUTINY COMMITTEE FOR TEE INITIATIVES	
	Establishing the terms of engagement of the scrutiny committee;	*600,000 (plus allowances - annual)*
	Sub Total Estimate	**600,000**
	DEVELOPING SHARED UNDERSTANDINGS AND USE OF TEE TERMINOLOGY	
a)	Developing a scholarly approach to Technology-Enabled Learning.	600,000
b)	Institutional activities aimed at raising awareness of TEE and its potential effects.	500,000
	Sub Total Estimate	**1,100,000**
	ENCOURAGE THE USE OF EXTERNAL RESOURCES FOR TEE TEACHING AND LEARNING	
	Exploring the use of OER within the educational Institution.	250,000
	Sub Total Estimate	**250,000**
	OUTLINE MEASURES FOR IMPROVING STI READINESS IN THE GAMBIA	
a)	Reassessing the gaps in STI Development;	600,000
b)	Review of access terms and usage of infrastructure including broadband;	250,000
	Sub Total Estimate	**850,000**

PART 2- SCIENCE TECHNOLOGY INNOVATION - STI		
NO	***OBNJECTIVES***	**ESTIMATED COSTS**
	IDENTIFYING THE SOURCES OF FUNDING FOR STI DEVELOPMENT	
a)	Identifying the stakeholder-beneficiaries eligible for funding in a given year and as per the national R&D plan;	250,000
b)	Government allocating 1% of GDP for R&D;	--
c)	Securing understanding with key development partners for funding;	100,000
	Sub Total Estimate	**350,000**
	DETERMINATION OF INCENTIVES FOR STI DEVELOPMENT WITH THE PRIVATE SECTOR	
a)	Having an annual incentive plan for STI;	250,000
b)	Government (MoHERST) entering into an MoU with the ICT Agency in relation to the incentives;	100,000
	Sub Total Estimate	**350,000**
	STRENGTHEN THE NATIONAL ASSEMBLY IN INNOVATION POLICY MAKING FOR STI	
a)	By establishing a specific national assembly committee for science and innovation and to serve as an overseer for the implementation of the innovation policy;	420,000 (annual allowance)
b)	By establishing an STI research and policy analysis support mechanism for the National Assembly as a whole. The objective is to improve the country's innovative capacities through various policy and legislative reforms.	1,000,000
	Sub Total Estimate	**1,420,000**
	ENHANCING THE MANDATE OF THE ICT AGENCY TO COMPLIMENT IMPLEMENTING THE STI STRATEGY	
a)	Spearhead the review and alignment of STI policy;	500,000
b)	Promote and nurture university–industry research and technology development partnerships, as well as industry partnerships;	600,000
c)	The establishment of a framework for the STI Council's relation with the ICT Agency and that of the national Assembly's committee;	200,000
	Sub Total Estimate	**1,300,000**
	DEVELOP THE PRIVATE SECTOR AND PROMOTE INNOVATION IN BUSINESSES FOR STI	
a)	Defining a PPP framework for STI Development;	250,000
b)	Having identified the potential private sector members for STI development;	250,000
	Sub Total Estimate	**500,000**

	HAVING A CLEAR FRAMEWORK FOR INTERNATIONAL COOPERATION AND COLLABORATION FOR STI	
a)	Identifying the partners for international cooperation;	250,000
b)	Assessing possibilities within the European Union–Africa Joint Strategy;	
c)	Considering the India–Africa Science and Technology Initiatives for cooperation;	250,000
d)	Looking into China–Africa Science and Technology Partnership for any possible cooperation;	
	Sub Total Estimate	**500,000**
	BUILD SKILLS AND ENTREPRENEURIAL CULTURE TO MEET MARKET DEMAND FOR STI	
a)	Identify the skills for STI Development;	250,000
b)	Carry out a market survey on the needs for innovation, research and development;	500,000
c)	Sub Total Estimate	**750,000**
	GOVERNMENT APPLICATION OF 1% OF GDP FOR RESEARCH AND DEVELOPMENT FOR STI	
	Making sure that there is determination by the Government through the national budget for 1% of the GDP to be allocated for STI (R&D) innovations;	100,000
	Sub Total Estimate	**100,000**
	CREATE AWARENESS FOR RESEARCH AND INNOVATION	
a)	Preparing the framework;	250,000
b)	Putting in place the required standards and guidelines;	600,000
c)	Database on R&D activities;	600,000
d)	Establish National Research and Development Council -NaRDC	15,000,000 set up
e)	Developed R&D uniform SOPs for fund management;	400,000
	Sub Total Estimate	**16, 850,000**
	LEGISLATIVE DETERMINATION OF REGULATORY FRAMEWORK FOR STI DEVELOPMENT	
a)	Carrying out a review of intellectual property rights (IPR) system;	300,000
b)	Carrying out a review of relevant regulations and develop relevant standards and guidelines for STI;	600,000
c)	Preparing and having a register of institutions for R&D;	250,000
	Sub Total Estimate	**1,150,000**

	DEVELOPED AND IMPLEMENTED NATIONAL RESEARCH AGENDA	
a)	Identifying the research agendas and the concerned institutions for R&D;	250,000
b)	Approving and publishing the national research agenda for a given year;	100,000
	Sub Total Estimate	**350,000**
	A FRAMEWORK FOR RESEARCH, ACCREDITATION AND QUALITY ASSURANCE	
a)	Preparing the framework;	250,000
b)	Putting in place the required standards and guidelines;	600,000
	Sub Total Estimate	**850,000**
	A LICENSING FRAMEWORK FOR RESEARCH PROJECTS FOR STI	
a)	Drafting and having approved licensing regulations for research projects;	250,000
b)	Preparing a comprehensive monitoring and evaluation framework for research programmes;	250,000
c)	Sub Total Estimate	500,000
	MAIN TOTAL ESTIMATES	**34,970,000**

13.4.2 Summary of the Estimated Costs

No	Objective	Estimated Cost
SUMMARY OF THE ESTIMATED COST		
PART 1- Technology Enabled Education - TEE		
a)	Carry out an assessment of the physical needs for TEE	650,000
b)	Prepare and endorse a policy for TEE;	1,100,000
c)	A national survey on status of TEE and the use of ICTs by educational institutions	1,700,000
d)	Reviewing and developing institutional policies and strategies in relation to TEE	3,150,000
e)	Having a comprehensive national governance framework for TEE	600,000
f)	Scrutiny committee for tee initiatives	600,000
g)	Developing shared understandings and use of TEE terminology	1,100,000
h)	Encourage the use of external resources for TEE teaching and learning	250,000
PART 2- Science Technology Innovation - STI		
a)	Outline measures for improving STI readiness in the Gambia	850,000
b)	Identifying the Sources of Funding for STI Development	350,000
c)	Determination of incentives for STI development with the private sector	350,000
d)	Strengthen the national assembly in innovation policy making for STI	1,420,000
e)	Placing the ICT Agency within the government framework for implementing the STI policy and strategy	1,300,000
f)	Develop the private sector and promote innovation in businesses for STI	500,000
g)	Having a clear framework for international cooperation and collaboration for STI	500,000
h)	Build skills and entrepreneurial culture to meet market demand for STI	750,000
i)	Government application of 1% of GDP for research and development for STI	100,000
j)	Create awareness for research and innovation	16,850,000
k)	Legislative determination of regulatory framework for STI development	1,150,000
l)	Developed and implemented national research agenda	350,000
m)	A framework for research, accreditation and quality assurance	850,000
n)	A licensing framework for research projects for STI	500,000
MAIN TOTAL ESTIMATES		**34,970,000**

13.5 Annex on Summary of the Goals, Objectives and Identified Actions

The table below is a summary of the goals, objectives and identified actions for the implementation of this Strategic Plan.

STRATEGIC ACTIONS FOR TEE			
NO		**OBJECTIVES**	**ACTIONS**
GOAL 1 – Policy Framework	a)	Carry out an assessment of the physical needs for TEE;	i. Identification of the key stakeholders for TEE development; ii. Identification of the resources needed for TEE in the country;
	b)	Prepare and endorse a Policy for TEE;	i. Basing the policy on the assessment report; ii. Stakeholder consultation; iii. Preparation of Cabinet paper for the policy;
GOAL 2 – Institutional Review	a)	A national survey with scope covering access to and use ICTs, the required infrastructure for TEE and the use of ICTs by educational institutions.	i. Determining survey questioners; ii. Engaging GBOS for the conduct of the survey;

	b)	*Reviewing and developing institutional policies and strategies in relation to TEE*	xii. *Auditing existing resources and infrastructure within the institutions in relation to TEE on the hardware and software and the digital infrastructure that is available for TEE.* xiii. *Identifying, inspecting and verifying the available resources;* xiv. *Evaluating and examining the status and utilization of the resources including the available hardware and software for TEE;* xv. *Establish the available standards and fitness of the digital infrastructure available for TEE;* xvi. *Developing the institutional stakeholders in preparation for and during the implementation of TEE.* xvii. *Recognizing and registering the stakeholders for TEE growth and development;* xviii. *Defining the guidelines in relation to the materials and resources for the adoption of TEE standards;* xix. *Setting up the organizational framework for stakeholders within the TEE ecosystem;* xx. *Engaging academic staff to develop TEE materials and resources.* xxi. *Identifying the key institutions and staff with interest in TEE development;* xxii. *Creating a database of the materials and resources;* *The above would be carried out only after identifying the parameters for review, the institutions the conduct of the review based on consultation. The report of the review would be used as a baseline for drafting the institutional policies and strategies that cover:* ✓ *Infrastructure and technical support* ✓ *Student assessment;* ✓ *Developing students' digital literacy;*

			✓ *The professional development of academic staff;* ✓ *Advancing and rewarding scholarly activities relating to TEE;* ✓ *Sharing TEE scholarship activities;* ✓ *The sharing of TEE activities;*

GOAL 3 Governance Structure	a)	*Having a comprehensive national governance framework.*	i.	*Identifying the membership of the governance framework;*
			ii.	*Having a recognition of the governance framework;*
	b)	*Scrutiny Committee for TEE initiatives*	iii.	*Deciding on the relevance and efficiency factors for the membership of this Scrutiny Committee;*
GOAL 4 - TEE in the National Curriculum	a)	*Developing shared understandings and use of TEE terminology within the national curriculum.*	i.	*Developing a scholarly approach to Technology-Enabled Learning.*
			ii.	*Institutional activities aimed at raising awareness of TEE and its potential effects.*
	b)	*Encourage the use of external resources for teaching and learning.*	i.	*Exploring the use of OER within the institution - Open Educational Resources or Digitized materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research.*
			ii.	*Having a plan for the students' use of the resources;*
			iii.	*Communicating the plan to the key stakeholder;*
			iv.	*Ensuring the acceptance and utilization of the plan;*

		STRATEGIC ACTIONS FOR STI	
NO		**OBJECTIVES**	**ACTIONS**
GOAL 1 Policy	a)	To outline measures for improving STI readiness in The Gambia in terms of infrastructure more specifically the access to broadband, e-Government platforms, reliable electricity and good transport network;	i. Reassessing the gaps in STI Development; ii. Review of access terms and usage of STI infrastructure including broadband;
	b)	Identifying the sources of funding for STI development;	i. Identifying the stakeholder-beneficiaries eligible for funding in a given year and as per the national R&D plan; ii. Government allocating 1% of GDP for R&D; iii. Securing understanding with key development partners for funding;
	c)	Determination of incentives for STI development with the private-sector;	i. Having an annual incentive plan for STI; ii. MOHERST MOICI, and ICT Agency entering into an MoU in relation to the incentives;
	d)	Strengthen the National Assembly in innovation policymaking;	i. By establishing a specific National Assembly committee for science and innovation and to serve as an overseer for the implementation of the innovation policy; ii. By establishing a research and policy analysis support mechanism for the National Assembly as a whole. The objective is to improve the country's innovative capacities through various policy and legislative reforms.

GOAL - 2 Governance	*a)*	*Enabling the ICT Agency to be part of the proper management and coordination of this Strategy's implementation. The main goals to drive the stakeholders for TEE and STI would be to:*	*The stakeholders are to:* *i. Spearhead the review and alignment of an the STI policy;* *ii. Promote and nurture university–industry research and technology development partnerships, as well as industry partnerships;* *Through:* ✓ *Promotion of knowledge and technology transfer from laboratories to businesses;* ✓ *Creating and using appropriate funding mechanisms or instruments for innovation in public and private enterprises;*
	b)	*Develop Human Resource Policies and Procedures Manual for the ICT Agency;*	*The ICT Agency to prepare its internal service rules and procedure manual;* *Having an approved service rules and procedure manual;*
	c)	*Acquiring an established head office for the Agency;*	*i. Identifying a place as the head office for the ICT Agency;* *ii. Finalising all modalities for the occupation and use of the head-office;*
	d)	*Promote stronger executive leadership through an STI council;*	*i. The Government to have a special active cabinet council for promoting STI;* *ii. The establishment of a framework for the STI Council's relation with the ICT Agency and that of the national Assembly's committee;*

GOAL - 3 Collaboration and Partnership		Develop the private sector and promote innovation in businesses.	Defining a PPP framework for STI Development; Having identified the potential private sector members for STI development;
		Having a clear framework for international cooperation and collaboration in order to attract talent and innovators.	i. Identifying the partners for international cooperation; ii. Assessing possibilities within the European Union–Africa Joint Strategy; iii. Considering the India–Africa Science and Technology Initiatives for cooperation; iv. Looking into China–Africa Science and Technology Partnership for any possible cooperation;
		Build skills and entrepreneurial culture to meet market demand.	i. Identify the skills for STI Development; ii. Carry out a market survey on the needs for innovation, research and development;
		Government application of 1% of GDP target for research and development.	Making sure that there is determination by the Government through the national budget;
		Create awareness for research and innovation.	Preparing an awareness campaign plan; Engaging the stakeholders for the awareness campaign;

GOAL 4 Research Framework		*Legislative determination of regulatory framework for STI Development*	i. *Carrying out a review of intellectual property rights (IPR) system;* ii. *Carrying out a review of relevant regulations and develop relevant standards and guidelines for STI;* iii. *Preparing and having a register of institutions for R&D;*
		Developed and implemented national research agenda;	i. *Identifying the research agendas and the concerned institutions for R&D;* ii. *Approving and publishing the national research agenda for a given year;*
		A framework for research, accreditation and quality assurance;	i. *Preparing the framework;* ii. *Putting in place the required standards and guidelines*
		A Licensing framework for research projects for STI ⌐L¬ ˌSEPˌ	i. *Drafting and having approved licensing regulations for research projects;* ii. *Preparing a comprehensive monitoring and evaluation framework for research programmes;*