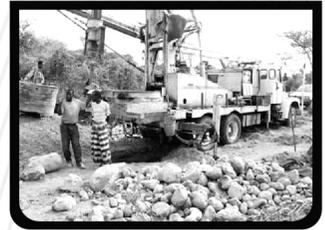




THE REPUBLIC OF UGANDA

# NATIONAL SCIENCE, TECHNOLOGY AND INNOVATION POLICY



Ministry of Finance, Planning and Economic Development

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# FOREWORD

Science is “the discipline by which humans search for knowledge and understanding about the physical environment in which they live” while technology is “scientific knowledge, products and their industrial application”. Science and Technology constitute the gathering and generation of knowledge about the physical and biological environment and the application of that knowledge for the welfare of mankind. The progression of science and technology is driven by innovation, which refers to changes in techniques, processes or technologies to produce a new or improved product or service.

The developed countries have advanced primarily because of their ability to effectively generate, develop and apply scientific and technological innovations as tools for achieving their national development objectives. These countries have improved the productivity and standards of living of their people through innovative application of science and technology. On the other hand, the developing countries have lagged behind largely due to their relatively modest development and application of science and technology. It is now common knowledge that the strength of a nation lies in the knowledge and skills of its people that can be acquired through education, training and practical application in the various fields of science and technology. Technological progress is thus a major determinant of the ability of a nation to realise the twin objectives of accelerating socio-economic development and wealth creation. Uganda has for many decades been struggling to meet the basic needs of its people such as adequate food, clothing, shelter, health, and education so as to substantially raise her living standards. In order to meet these needs and to keep pace with the rest of the world, Uganda must harness her natural resources through innovative application of science and technology. It is only through the use of Science, Technology and Innovation as effective instruments of development that a sustainable future for the people of Uganda can be ensured.

To date, significant scientific research and development (R&D) has been undertaken in Uganda but only in a few areas. Progress of research and development activities has been constrained by a number of challenges, which include low level of coordination among stakeholders leading to duplication of efforts, low capital base, inadequate infrastructure and most importantly lack of a coherent and overarching National Science, Technology and Innovation (STI) Policy to guide activities and distribution of resources for science, technology and innovation. The above-mentioned challenges coupled with shortage of skilled human resources, over dependence on foreign technology, and inadequate social consciousnesses of the role of STI in national development have combined to keep Uganda underdeveloped. Uganda recognises that given the limitations of her production factor endowments, the mounting pressures of providing for basic needs of the growing population and accelerating the pace of economic development cannot be tackled without enhanced capacity in science, technology and innovation. It is, therefore, essential that STI are prioritised in the overall development strategy of the country.

In order to address these challenges and the urgent need for economic growth and transformation, the Government of Uganda has through an extensive consultative process, formulated a comprehensive and overarching Science, Technology and Innovation (STI) Policy. The policy sets out a vision for the STI sector and highlights strategic frameworks for its attainment. In summary, the proposed STI Policy provides a mechanism for increased capacity in STI that will result in significant improvements in national productivity leading to competitiveness and better standards of living for the people of Uganda in line with the National Development Plan for the period 2010/11 - 2014/15 and beyond.



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Honourable Prof. Ephraim Kamuntu

**Minister of State for Finance, Planning and Economic Development (Planning)**

# ACRONYMS

<b>ARIPO</b>	Africa Regional Industrial Property Office
<b>CBOs</b>	Community-Based Organisations
<b>DNA</b>	Deoxyribonucleic Acid
<b>EAC</b>	East African Community
<b>EACST</b>	East African Commission for Science and Technology
<b>EFAG</b>	Education Funding Agencies Group
<b>EPRC</b>	Economic Policy Research Centre
<b>ESA</b>	Education Standards Agency
<b>FTE</b>	Full Time Equivalent
<b>GAL</b>	Government Analytical Laboratory
<b>GDP</b>	Gross Domestic Product
<b>GERD</b>	Gross Expenditure on Research and Development
<b>ICT</b>	Information and Communication Technology
<b>IK</b>	Indigenous Knowledge
<b>IP</b>	Intellectual Property
<b>IPR</b>	Intellectual Property Rights
<b>LCs</b>	Local Councils
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MAAIF</b>	Ministry of Agriculture, Animal Industry and Fisheries
<b>MEMD</b>	Ministry of Energy and Mineral Development
<b>MFPEd</b>	Ministry of Finance, Planning and Economic Development
<b>MGLSD</b>	Ministry of Gender, Labour and Social Development
<b>MIA</b>	Ministry of Internal Affairs
<b>MICT</b>	Ministry of Information and Communication Technology
<b>MJCA</b>	Ministry of Justice and Constitutional Affairs
<b>MLUP</b>	Ministry of Lands and Urban Planning
<b>MOES</b>	Ministry of Education and Sports
<b>MOFA</b>	Ministry of Foreign Affairs
<b>MOH</b>	Ministry of Health
<b>MOLG</b>	Ministry of Local Government
<b>MPS</b>	Ministry of Public Service
<b>MSI</b>	Millennium Science Initiative
<b>MTEF</b>	Medium Term Expenditure Framework
<b>MTTI</b>	Ministry of Tourism, Trade and Industry
<b>MWE</b>	Ministry of Water and Environment
<b>MW&amp;T</b>	Ministry of Works and Transport
<b>NARC</b>	National Agricultural Research Council
<b>NARO</b>	National Agricultural Research Organisation
<b>NBC</b>	National Biosafety Committee
<b>NCCI</b>	National Chamber of Commerce and Industry
<b>NCDC</b>	National Curriculum Development Centre

<b>NCHE</b>	National Council for Higher Education
<b>NDA</b>	National Drug Authority
<b>NDP</b>	National Development Plan
<b>NEMA</b>	National Environment Management Authority
<b>NEPAD</b>	New Partnership for Africa's Development
<b>NFA</b>	National Forest Authority
<b>NGOs</b>	Non-Governmental Organisations
<b>NIMES</b>	National Integrated Monitoring and Evaluation Strategy
<b>NITA</b>	National Information Technology Agency
<b>NOTU</b>	National Organisation of Trade Unions
<b>NPA</b>	National Planning Authority
<b>NUDIPU</b>	National Union of Disabled Persons of Uganda
<b>OECD</b>	Organisation for Economic Cooperation in Development
<b>OP</b>	Office of the President
<b>OPM</b>	Office of the Prime Minister
<b>PEAP</b>	Poverty Eradication and Action Plan
<b>PPDA</b>	Public Procurement and Disposal of Public Assets Authority
<b>PSF</b>	Private Sector Foundation
<b>R&amp;D</b>	Research and Development
<b>RDCs</b>	Resident District Commissioners
<b>RDIs</b>	Research and Development Institutions
<b>SETIs</b>	Science, Engineering and Technology Institutions
<b>SMEs</b>	Small and Medium Enterprises
<b>STI</b>	Science, Technology and Innovation
<b>UBC</b>	Uganda Broadcasting Council
<b>UBOS</b>	Uganda Bureau of Statistics
<b>UCC</b>	Uganda Communication Commission
<b>UCET</b>	Uganda Consumer Education Trust
<b>UCPA</b>	Uganda Consumer Protection Association
<b>UCPC</b>	Uganda Cleaner Production Centre
<b>UIA</b>	Uganda Investment Authority
<b>UIRI</b>	Uganda Industrial Research Institute
<b>ULAA</b>	Uganda Local Authorities Association
<b>UMA</b>	Uganda Manufacturers' Association
<b>UNAB</b>	Uganda National Association of the Blind
<b>UNBS</b>	Uganda National Bureau of Standards
<b>UNCST</b>	Uganda National Council for Science and Technology
<b>UNFFE</b>	Uganda National Farmers' Federation
<b>UNHRO</b>	Uganda National Health Research Organisation
<b>UNISE</b>	Uganda National Institute for Special Education
<b>URA</b>	Uganda Revenue Authority
<b>USPTO</b>	United States Patent and Trademarks Office
<b>USSIA</b>	Uganda Small Scale Industrial Association
<b>UWA</b>	Uganda Wildlife Authority

# GLOSSARY

**Applied Research**

Original work aimed at acquiring new scientific or technical knowledge. It is geared towards a specific practical objective (also see Research and Development).

**Appropriate Technology**

Technology that is most suitable for the environment and culture it is intended to support (also see Technology).

**Basic Research**

Original work aimed at obtaining new scientific knowledge. It may not be directed to a specific practical aim or application.

**Bioprospecting**

The search for (identification, collection, extraction and screening) useful chemical ingredients from biological materials.

**Competitiveness**

The ability to efficiently and effectively manage scarce resources to produce high quality goods and services at relatively low prices.

**Disadvantaged groups**

Refer to women, youth, children, disabled, sick, old and poor who by their social-economic circumstances do not fully enjoy their human rights or societal entitlements.

**Engineering**

The application of science and mathematics that makes use of materials and energy in such forms as machines, products, structures, processes and systems.

**Ethics**

Moral principles, rules and standards of conduct.

**Innovation**

Refers to changes of techniques, processes, technical activities or technologies to produce a new or improve on a product or a service.

**Intellectual Property**

The intangible product of the mind in form of knowledge and conceptual ideas.

**Intellectual Property Rights**

Legal structures that give ownership rights to creators of new knowledge and ideas.

**Patent**

A right given by a competent authority to an inventor to enjoy exclusive rights to exploit his invention for a given period of time.

**Policy**

A course of action that has been officially chosen and agreed upon by Government or other organisations.

**Research and Development**

These are the two key processes of developing and applying new knowledge.

**Science**

Discipline by which humans search for knowledge and understanding about the physical world in which they live. It is knowledge covering general truths or natural laws that explain why something happens.

**Technology**

Knowledge about scientific or industrial methods and their application, including machinery and equipment developed as a result of this knowledge. It is, therefore, the practical use of human knowledge of the natural environmental materials into useful products.

**Technology Transfer**

Sharing of facilities, theoretical and practical skills and know-how among the producers and the consumers of scientific knowledge.

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# 1.0 BACKGROUND TO THE SCIENCE, TECHNOLOGY AND INNOVATION POLICY

## 1.1 Rationale for the STI Policy and Its Formulation Process

### 1.1.1 The Existing Policy Environment

Uganda has since 1994 been involved in formulation of a national STI policy through several stakeholder consultations on technical processes. The current draft policy was reviewed in 2001 and 2006 to take into account new developments in science, technology and innovation (STI). However, Government has not formally adopted a national STI policy to date. Therefore, Uganda currently does not have a comprehensive and overarching national STI policy to facilitate development of the sector. The country's STI system is currently managed through a constellation of macro and sector policies that lack STI specific indices of development. This has resulted into growing public concern, especially among the scientific and research community, about the near relegation of STI as a development priority; and the ad hoc and often uncoordinated responses to STI demands at both sector and national level.

### 1.1.2 National Development Initiatives

There are a number of national development policy initiatives such as the National Development Plan (NDP) which is a successor to the Poverty Eradication Action Plan (PEAP), the Plan for Modernisation of Agriculture (PMA), the Industrial Development Strategy, the Medium Term Competitive Strategy (MTCS) for private sector development, and the Millennium Science Initiative (MSI), (Box 1) that are relevant to the STI sector through vertical and horizontal linkages.

#### **Box 1: Recent Key National Policies Impacting the STI Sector**

Constitution of the Republic of Uganda, 1995  
 Poverty Eradication Action Plan, 2004/05 – 2007/08  
 National Development Plan 2010/11 – 2014/15  
 Plan for Modernisation of Agriculture, 2006/07  
 Health Policy, 2001/02  
 Science Education Policy, 2005  
 National Agricultural Research Policy, 2004  
 National Environmental Management Policy, 1995  
 Information and Communication Technology Policy, 2003  
 National Forestry Policy, 2001  
 National Gender Policy, 1997

### 1.1.3 Regional and International Commitments

Uganda is party to a number of regional and international agreements on STI (Box 2), especially under the United Nations, the Commonwealth, the African Union, the New Partnership for Africa's Development (NEPAD) and the East African Community (EAC). These are premised on a sound STI policy environment among partner countries.

#### **Box 2: Key International Obligations with Implications on the STI System**

UN Framework Convention on Climate Change, 1994  
 Convention on Biological Diversity, 1993  
 Kyoto Protocol, 2005  
 Cartagena Biosafety Protocol, 2003  
 Montreal Protocol, 1992  
 Basel Convention (Movement and Disposal of Hazardous Waste), 1992  
 Rotterdam Protocol on Prior Informed Consent, 2004  
 Trade Related Aspects on Intellectual Property Rights, 1994  
 General Agreement on Tariffs and Trade, 1994  
 Uruguay Round, 1994

### 1.1.4 Importance of STI to Development

Government of Uganda recognises that science, technology and innovation (STI) are critical to Uganda's socio-economic growth and transformation. In addition, Government recognises the key role that STI play in fostering research and development and in building the human capital that Uganda requires for managing and sustaining the future knowledge-based economy.

### 1.1.5 STI Stakeholders

The Government also recognises the multiplicity and diversity of STI stakeholders whose interests, roles and responsibilities need to be defined and coordinated. These include the central government, SETIs, local government, private sector, NGOs and CBOs, academia, researchers, science and technology professionals, policy makers and implementers, development partners, farmers, artisans, consumers of products of STI activities, and the general public.

### 1.1.6 Policy Formulation Context and Process

Having recognised the importance of science, technology and innovation in development, in light of the wider national development initiatives and, deriving from the Uganda National Council for Science and Technology (UNCST) Statute No.1 of 1990 (CAP 209 of the Laws of Uganda) provisions on STI policy formulation, the Government of Uganda (GOU) through the UNCST initiated the STI policy formulation process in 1994 and conducted subsequent policy reviews in 2001 and 2006 as part of the strategic undertaking for integrating science, technology and innovation in the national development process. The Council involved various stakeholders in the national STI system in identifying major issues of policy concern and continuous debates on both

the content and strategic direction of the current version of the Draft National STI Policy. The policy formulation process more recently capitalised on Government efforts to reform the science, technology and innovation sector that were initiated in the financial year (FY) 2004/05. Government conducted comprehensive situation analyses of the status of STI in Uganda as part of the process of revitalising the STI sector. The Country STI Profile and other empirical studies established the sector requirements for effective development and contribution to the national economy. Several consultative stakeholders' fora were convened during FY 2004/2005 to enrich the draft STI policy. Consequently, the current STI Policy contains empirical findings of the sector studies, stakeholder aspirations as well as government commitment to science, technology and innovation development.

The Policy, therefore, consolidates previous efforts and provides new strategic directions for sustainable development of the STI sector and the national economy. The Policy is a foundational platform for Uganda's transformation and prioritises strategic areas of action. It sets targets and defines organisational and management requirements for a fully operational national science, technology and innovation system. The policy supports Uganda's STI capacity building in various aspects including technology generation, transfer and application. It will nurture STI as a productive sector, improve productivity in all economic sectors and facilitate implementation of Uganda's regional and international obligations.

## **1.2 Opportunities and Constraints in the STI Sector**

### **1.2.1 The Status of STI Development in Uganda**

#### **1.2.1.1 STI Infrastructure and Services**

Uganda's science and technology infrastructure currently comprises 27 Universities out of which six offer science and engineering courses; 33 science-related vocational and technical institutes (NCHE 2005)<sup>1</sup>; 20 active R&D institutes, two national museums; one functional public library and five private laboratories (UNCST, 2008)<sup>2</sup>. The national expenditure on science and technology services increased from US\$ 49.2 billion in fiscal year 2002/2003 to US\$ 77.1 billion in FY 2005/2006. This signifies a modest improvement in activities concerned with R&D and contributing to the generation, dissemination and application of scientific and technical knowledge. Overall this level of STI infrastructure is inadequate to facilitate STI-driven development.

#### **1.2.1.2 Human Resources Development**

Uganda's human resources in science and technology of 0.5 researchers' Full Time Equivalent (FTE) per 1,000 members of the workforce is far too inadequate compared with over 5 per 1,000 for the developed countries (UNCST, 2005)<sup>3</sup>.

<sup>1</sup> NCHE (2005). The state of Higher Education in Uganda: A report of a survey of Uganda's Higher Institutions of learning. Uganda National Council for Higher Education, Kyambogo.

<sup>2</sup> UNCST (2008). Science, Technology and Innovation: Uganda's Status Report. Uganda National Council for Science and Technology, Kampala.

<sup>3</sup> UNCST (2005). Innovation Survey: Uganda's Status Report. Uganda National Council for Technology, Kampala.

At the same time, the ratio of 1.0 R&D personnel (researchers, technicians and other S&T support staff) per 1,000 of labour force is considerably lower than that of OECD countries that ranges between 5 and 18 R&D personnel per 1,000 labour force.

The current education system emphasizes theoretical academic work with little depth of applied science, engineering and technical skills which are central to technological innovation. Presently, there are 27 public and private universities in Uganda of which only six offer science and technology related programmes. The ratio of arts to S&T graduates at these Universities is 5:1. Graduates at master's and doctoral levels in science and technology fields are few and less than ten persons graduate with PhDs in S&T per annum. Apart from Makerere University, which was ranked 54th in Africa in 2007, the overall ranking of other Ugandan Universities and specialised STI institutions is extremely low, compared to other Universities in the developing world.

### 1.2.1.3 Research and Development

Ugandan Universities and Research and Development (R&D) Institutions have a weak research capacity. Only 91 scientific publications were produced in internationally recognised scientific journals in 2001 (USPTO, 2001; UNCST, 2005). Given the limited research capacity, the bulk of research work is of basic nature with limited potential for industrial development. In situations where applied and development research undertaken, it is rarely transformed into feasible technological packages for the production of goods and services.

The majority of high quality scientific research activities in Uganda are carried out in few research institutes especially in the fields of agricultural and medical sciences. Some Ugandan scientists have made world-class discoveries in HIV/AIDS prevention and vaccine trials, cassava mosaic eradication and development of clonal coffee. These are supported mainly by foreign sources of funds.

Uganda government's expenditure on R&D as a percentage of GDP amounted to 0.3% in 2005/06. This is below the recommended 1% for the nations of Africa (AU, 2005)<sup>4</sup>. There are 724 researchers involved nationally in R&D activities out of which 38% are female. Fifty three percent of the researchers work in government, 36% in higher education sector, 8% in business sector and 3% in private non-profit sector (UNCST, 2006)<sup>5</sup>.

The national expenditure on research and development fluctuated between Ushs 39.8 billion in 2002/03 and US\$ 34.5 billion in 2005/2006. This implies that funding for research and development largely comes from foreign sources.

<sup>4</sup> African Union (2005). Africa's Science and Technology Consolidated Plan of Action. African Union, Addis Ababa

<sup>5</sup> UNCST (2006). State of Science, Technology and Innovation: Expenditure Analysis. Uganda National Council for Science and Technology, Kampala.

### 1.2.1.4 Investments in STI Development

Government is aware of the need for stronger capacity in science and technology for addressing the goals of the Poverty Eradication Action Plan (PEAP) and promoting Uganda's industrialisation efforts. S&T as a percentage of government expenditure has increased from 3.3% in 2004/05 to 3.7% in 2005/06. During FY 2005/06, government spent US\$ 138 billion on S&T of which R&D accounted for 25%, S&T education and training 19%, and S&T services 56% (Table 1). This is indicative of significant government commitment to develop the STI sector that should be enhanced and sustained over the long term.

**TABLE I.1 : STI SECTOR FUNDING FY 2005 / 2006**

Item	Recurrent	Capital	Total	Donor Contribution to GOU Budget	Breakdown of Donor funding to S&T
R&D <sup>6</sup>	5,423,710	29,107,342	34,531,052 (25%)	19,630,248 (56.8%)	52.7%
STET <sup>7</sup>	10,053,201	16,179,500	26,232,701 (19%)	11,497,500 (43.8%)	30.8%
STS <sup>8</sup>	35,430,876	41,717,500	77,148,376 (56%)	6,132,000 (7.9%)	16.5%
<b>S&amp;T (1+2+3)</b>	<b>50,907,787</b>	<b>87,004,342</b>	<b>137,912,129 (100.0%)</b>	<b>37,259,748 (27%)</b>	<b>100.0%</b>

R&D as % of GDP	0.3%
R&D as % of Government Expenditure	0.9%
S&T as % of GDP	1.2%
S&T as % of Government Expenditure	3.7%

Source: : MFPEd<sup>9</sup>, 2005/06; UNCST, 2007.

**Donor funding of the S&T sector currently accounts for 27% of total funding for S&T of which 52.7% supports R&D, 30.8% Science and Technology Education and Training and 16.5% S&T services. Sustainable funding support by donors requires consolidation of sources and focus on national STI priorities.**

<sup>6</sup> Research and Development

<sup>7</sup> Scientific and Technical Education and Training

<sup>8</sup> Scientific and Technical Services

<sup>9</sup> MFPEd (2005/06). Draft Estimates of Revenue and Expenditure (Recurrent and Development FY 2005/06). Ministry of Finance, Planning and Economic Development, Kampala

### **1.2.1.5 Product Development and Innovation**

Innovation is the driving force of a nation's economic development and improvement of competitiveness of its enterprises. The innovation capability of firms in Uganda is still very low. S&T innovations survey conducted by UNCST in 2005 revealed that 57% of firms introduced at least one new product or service or improved on an existing product or service in the market over the last five years. Most of the products/processes were from firms engaged in agriculture and agro-processing.

The Government established an STI fund in FY 2003/2004 for local innovations as a mechanism to support and facilitate the national innovation system. Some of the measures envisaged to address the various challenges within the national innovation system (NIS) include the sensitisation of local innovators, establishment of institutional mechanisms for promoting innovations, and integrating S&T innovations within the National S&T Policy. The Innovation fund is currently under review and its sustainability uncertain.

### **1.2.1.6 Legal and Regulatory Framework**

Uganda has developed regulatory frameworks for STI such as the Patents Act (2002), Research Registration and Clearance Policy and Guidelines (2007), National Guidelines for Research involving Humans as Research Participants (2007), and the National Environment Regulations (2005). Instruments to regulate application of the frameworks are embedded in provisions of sectoral laws that relate to broader areas such as agriculture and environment. As a result, various institutions implement elements of STI as stipulated in their mandates. However, this has in some instances, led to duplication of effort, conflict of interest and disjointed coordination of regulation of science, technology and innovation.

### **1.2.1.7 IPR Protection – Patenting of Innovations**

The number of Patents held by citizens is a good indicator of the technological capacity of a nation. Uganda Registration Bureau Services (URBS) statistics indicate that by 2004, a total of 26,198 trademarks had been registered, and of these, only one-third was local. In the case of patents, very few applications are received annually. According to recent UNCST survey data, only 40 patents have so far been granted for local inventions. Usually less than three patent applications are submitted in a year. The low number of patent applications is largely attributed to the low innovative activities, the low percentage expenditure on R&D to GDP and the small number of scientists and engineers actively involved in R&D activities.

## **1.3 Challenges Facing Uganda's STI System**

### **1.3.1 Institutional Challenges**

#### **1.3.1.1 The Policy Framework:**

The Uganda National Council for Science and Technology (UNCST) was established by Government in 1990 as the agency responsible for coordination of the science, technology and innovation system. In 2001 it developed and in 2006 reviewed the national science and technology policy which the Government had not yet formally adopted. The absence of a comprehensive and overarching national STI policy has been fully responsible for under development and near relegation of STI as a development priority.

#### **1.3.1.2 The Institutional and Legal Framework:**

Uganda's STI system is fragmented. It is governed by a combination of sectoral ministries and numerous autonomous institutions (Councils, Commissions, and Authorities) whose mandates, in some instances, with regard to S&T development, appear to overlap rather than complement and enhance each other. The existence of a plethora of science, technology and engineering institutions (SETIs) often with somewhat parallel mandates complicates the national STI coordination function of government. Moreover, the UNCST Statute No.1 of 1990 (Cap 209 of the Laws of Uganda 2002) does not explicitly spell out the UNCST regulatory functions or adequately empower it to undertake the co-ordination function for effective execution of its mandate. UNCST, therefore, uses guidance and advice approaches rather than the more effective legal and regulatory framework in the management of science, technology and innovation development.

#### **1.3.1.3 The Financial Resources Base:**

There is currently no sustainable provision for financing of STI, especially R&D, which has so far been put in place. As a result, support for STI is inadequate and scattered across various economic sectors. Consequently, the system is under funded to the extent that over 50% of R&D funding is from external sources. The modest financial resources that are availed to the publicly funded SETIs have limited the scope and magnitude of their programs and constrained institutional development in terms of S&T infrastructure, human resources and programs.

#### **1.3.1.4 Institutional Infrastructure and Human Resource Capacity:**

Due to the above-mentioned financial challenge, SETIs find it difficult to acquire and maintain infrastructure for R&D and administration. Similarly the SETIs face human resource capacity challenges largely due to uncompetitive pay levels, non-conducive work facilities and conditions.

## 1.3.2 STI Sector wide Challenges

### 1.3.2.1 Institutional Capacity:

The increasing demands by stakeholders on the STI system have outstretched the limited financial and human resources available for science, technology and innovation development. The prevailing STI labour situation cannot support the required expansion of industry, which requires more engineers, technicians and artisans.

### 1.3.2.2 Financing:

Limited financial resource base for the STI sector resulting from the competing demands on the limited national resource envelope and other unforeseen circumstances such as compelling needs for changes in national development priorities is a formidable challenge to STI sector development.

Science, technology and innovation by its nature is not favoured by the current funding modality of the medium term expenditure framework (MTEF) which is based on the need for immediate outputs and returns to the economy. The long time lags between research and product development which are characterised by a high degree of uncertainty and a minimum likelihood of immediate direct contribution to gross domestic product (GDP) as required under the MTEF makes it hard to demonstrate the short-term impact of STI on the economy. STI requires a different funding arrangement that entails sustained long term financing commitments in order to realise its long-term contribution to the GDP.

## 1.3.3 Global Challenges

These challenges are a result of the globalization process in which the world's economy is driven by information, technology and knowledge. Like many other developing countries, Uganda is currently afflicted by both the digital and economic divides between developed and developing economies that exacerbate the challenges of underdevelopment. These divides threaten to further exclude Uganda from participating in or benefiting from cutting edge scientific technological advances. The digital divide is typified by the relatively low level of penetration of information and communication technology, while economic divide is typified by Uganda's co-existence with relatively economically advanced economies in a trade relationship where Uganda is a net importer and market for technology intensive and high value products from developed economies. The economic divide is exacerbated on one hand, by Uganda's low productive capacity and bargaining power in the global market, and on the other, by the inability to cope with the rapid pace of technological advancements in the developed world.

Furthermore, the global trade and intellectual property policies tend to disfavour countries that are still in the infant stages of technological advancements. This stifles opportunities for technology transfer and local innovation leading to, among others, technological terms of trade and balance of payments favourable to the relatively advanced and modern economies.

The budding local scientific innovation and product development is variously affected by unfavourable global terms of trade and intellectual property policies. The local commodity market for nationally produced products is open to competition with commodities produced at an advantage of scientific knowledge and economies of scale. The foreign highly protected markets are almost impenetrable for the locally produced commodities. The opening of foreign markets through international and regional trade initiatives could provide an opportunity for Uganda to develop local innovation and product development capacity. This requires the development of a strong, modern and sustainable STI system.

## **1.4 Contribution of STI to Development**

Science, technology and innovation (STI) are critical to sustainable socio-economic growth and transformation of Uganda. The Government recognises the key role that STI plays in fostering research and development and in building the human capital that Uganda requires for the future knowledge-based and competitive economy. There is ample evidence to illustrate that the ability to compete in the provision of high quality products and services largely depends on the level of investment in STI. Developed and emerging industrialised countries spend 2% to 3% of their GDP on research and development; on average 0.2-0.3% of Uganda's GDP is spent on R&D which is far too small for STI and R&D to have a meaningful impact on the economy. It is, therefore, essential to provide high priority to scientific and technological development needs in the overall socio-economic development strategy of the country. STI is envisaged to contribute effectively to diversification and modernisation of the economy and sustainable use of human and natural resources. Some of the contributions of STI to different aspects of the economy are presented below.

### **1.4.1 Economic Growth:**

Industrialised countries have grown faster than developing countries over time, because of higher investments in STI that has led to increased firm level productivity resulting in high GDP growth rates.

### **1.4.2 Employment Creation:**

Technological progress leads to increased factor productivity, firm expansion, increased labour absorption capacity and employment.

### **1.4.3 Technological Progress and Export Promotion:**

Technological progress leads to cost reductions and increase in productivity. Innovating firms are able to cut down the costs of production and thus increasing output for both local and foreign markets. The higher quality and lower prices of goods and services resulting from increased productivity are likely to increase international competitiveness and boost foreign exchange earnings.

#### **1.4.4 Human Capital Development in Science and Technology:**

Economies that are driven by scientific and technological innovation rely on existence of a critical mass of scientists and engineers. Capacity building in STI fields is therefore essential for building this human resource base for STI-led growth.

#### **1.4.5 Environmental Conservation:**

S&T contributes to a good environment and a rich natural resource base, which are all critical for poverty eradication and economic growth. It is estimated that this sector accounted for 54.4% of the total GDP in 1998 (UEPB, 2004).

#### **1.4.6 Science Tourism:**

Science-based tourism focuses on flora, fauna, visits to scientific parks etc. Uganda's tourism is largely confined to the nature tourism segment with some small contributions from cultural tourism, rural tourism and business travel. Tourism represented a quarter of the total value of exports of goods and services that the country generated in 2004. The total revenue from exports of services was US\$ 700 million of which about 45% was from tourism (UEPB, 2004).

#### **1.4.7 STI and Rural Livelihoods:**

Science, technology and innovation play a significant part in shaping the livelihoods of the rural population that include peasant farmers, artisans, traders and casual workers. The amount of technology available to the rural communities determines the health, productivity, level of development and socio-economic well-being of the rural population which currently constitutes over 70% of the total (UBOS, 2005). A significant proportion of the 31% of Uganda's population that is below the poverty line, live in rural areas largely due to low levels of STI development in those areas

### **1.5 STI System Coordination**

#### **1.5.1 Coordination**

The STI system has been coordinated by UNCST through a framework of multi-sectoral Council, several sectors and inter-disciplinary committees on agriculture, health, ICT, industry, physical sciences, natural sciences, social sciences and humanities. The framework emphasises individuals rather than institutional representation and requires strengthening in terms of composition, numbers and modality of work as well as inter-sectoral and inter-institutional linkages and collaboration.

#### **1.5.2 Institutional Responsibilities**

The responsibility for managing the STI activities and several technology-intensive programmes is currently entrusted in various government institutions such as departments, Authorities, Commissions, Councils and some private sector institutions that have very little coordination and limits sharing of lessons and experiences. This policy emphasises the need for a clear coordination framework among the various SETIs.

## 2.0 GUIDING PRINCIPLES

The guiding principles for the National Science, Technology and Innovation Policy include the following:

### **2.1 National Development Objectives:**

This STI policy is consistent with the national development objectives, which are poverty eradication, industrialisation, agricultural modernisation, increased productivity, employment creation, value addition and gender mainstreaming.

### **2.2 Policy Harmony:**

From 1990 Uganda has been operating fragmented and inadequately coordinated Science and Technology related policies and regulatory regimes. These shall be harmonised and integrated within the national development framework for greater consolidated impact on national development and poverty eradication.

### **2.3 Promotion of Innovation and Scientific Excellence:**

This policy provides a framework for supporting local innovation and scientific excellence by funding national research priorities, providing infrastructure for technology generation and incubation, supporting local innovations and rewarding scientific excellence.

### **2.4 Regional Integration:**

Uganda is party to the revival of the East African Community (EAC), which provides a framework for regional cooperation in trade, industry, and STI among others. Development of a comprehensive STI policy is imperative for Uganda as it strives to actively participate in EAC activities including regional development cooperation.

### **2.5 International Obligations:**

In view of the government's responsibility to fulfil her commitments in various international agreements, this policy guides the sector's implementation of the country's international obligations in science, technology and innovation.

### **2.6 Safety and Health:**

This policy promotes research ethics and safety for protection of the environment, human and animal health.

### **2.7 Gender and Equity:**

This policy promotes active participation of all women and men, youth, children, the elderly and other disadvantaged or special groups in science, technology and innovation development.

## **2.8 Private Sector Participation:**

The development of STI in Uganda requires active participation of the private sector. This policy promotes private sector participation and investment in science and technology.

## **2.9 Competitiveness:**

This policy supports the establishment of a framework that promotes product development, quality assurance and standardisation of goods and services in order to improve Uganda's international competitiveness.

## 3.0 GOAL & OBJECTIVES

### 3.1 Goal

The goal of this policy is to strengthen national capability to generate, transfer, and apply scientific knowledge, skills and technologies that ensure sustainable utilisation of natural resources for the realisation of Uganda's development objectives.

### 3.2 Objectives

The Objectives of the policy are to:

- i. Create an enabling policy environment to foster STI and augment their contribution to national development.
- ii. Build the STI sector capacity to generate and transfer technology.
- iii. Establish and strengthen the legal and regulatory framework to ensure ethics and safety in STI development and application.
- iv. Strengthen the STI coordination framework to enhance the sector's performance and contribution to national development.

## 4.0 POLICY STATEMENTS & STRATEGIC ACTIONS

Strategic actions for the implementation of this Policy will be guided by the principles outlined in Section 2. Strategic actions for addressing specific policy areas shall be undertaken as outlined below:

### 4.1 Create an Enabling Policy Environment to Foster STI and Augment their Contribution to National Development

#### 4.1.1 Technology Forecasting, Assessment and Transfer

##### **POLICY STATEMENT 1 :**

***Assess, forecast and advise on issues regarding STI, taking into account current and future trends in development, transfer and diffusion of both local and foreign STI outputs.***

**Strategic actions for implementation of the above statement include:**

- i. Conducting technology audits and forecasts and advising government on STI Policy and programs.
- ii. Conducting policy studies on topical issues to facilitate evidence-based advice and informed decision-making in all matters pertaining to STI.
- iii. Evaluating and promoting technology choices for public and private sector investment.
- iv. Creating a system to facilitate the transfer, promotion and development of technologies.
- v. Strengthening collaboration with Research and Development Institutions (RDIs), professional bodies, private sector, NGOs and civil society to accelerate technology transfer and utilisation.

#### 4.1.2 Industrial Development

##### **POLICY STATEMENT 2 :**

***Provide a conducive environment for industrial development in Uganda.***

### Strategic actions for implementation of the above statement include:

- i. Support to development of Small and Medium Enterprises (SMEs) through facilitation of access to new knowledge, technologies and services.
- ii. Support to R&D and innovation efforts in the industrial sector.
- iii. Promoting initiatives for increased productivity, improved product quality and quality control.
- iv. Fostering linkages among industry, public and private sectors through technology platforms and internship programmes.
- v. Encouraging linkages between industry and universities and other tertiary institutions for scientific research, innovation, development and commercialisation of products.
- vi. Promoting and adopting cleaner production technologies and practices that are consistent with global efforts to mitigate climate change.

#### 4.1.3 Intellectual Property Management

##### **POLICY STATEMENT 3 :**

***Facilitate and encourage S&T innovation through protection and use of Intellectual Property Rights.***

### Strategic actions for implementation of the above statement include:

- i. Enacting appropriate legislation to ensure sustainable use of natural resources, equitable benefit sharing, protection of creativity and innovation.
- ii. Establishment of a fully-fledged national intellectual property rights (IPR) office to undertake searches, formal and substantive examinations, grant and register patents, trademarks, copyrights and other IPRs.
- iii. Promotion of membership to regional and global organisations dealing with IPR in order to enhance efficiency and cost effectiveness of the national system.
- iv. Facilitating the setting up of institutional support systems for production, protection and commercialisation of innovations and artistic works.
- v. Incorporating aspects of IPR in the school curricula at various levels of education in order to improve awareness.
- vi. Facilitating the protection and beneficial exploitation of indigenous technologies.
- vii. Support to fora aimed at sensitising the public on IPR matters.

#### 4.1.4 Traditional, Conventional and Emerging Technologies

##### **POLICY STATEMENT 4 :**

***Guide the judicious use and application of traditional, conventional and emerging technologies for sustainable development.***

### Strategic actions for implementation of the above statement include:

- i. Development of a legal and regulatory framework for R&D activities in traditional, conventional and emerging technologies, including among others indigenous knowledge, biotechnology, nano technology, information and communication technology, and micro electronics.
- ii. Support the development of appropriate methodologies for the application of traditional, conventional and emerging technologies.
- iii. Organising and supporting the development of facilities, human resources and technology centres in order to promote and coordinate traditional and emerging technology activities and their diffusion.
- iv. Support efforts to promote awareness, knowledge and application of traditional and emerging technologies through formulation of relevant policies and other support mechanisms.

#### 4.1.5 Gender and Equity

##### **POLICY STATEMENT 5 :**

***Mainstream and actively involve the special needs groups, men, women, and children in all STI activities in order to ensure that the resultant impacts are evenly spread across all sections of society.***

### Strategic actions for implementation of the above statement include:

- i. Introduction of STI education and training at all levels of schooling and advancement of special efforts to facilitate participation of disadvantaged groups in science and technology.
- ii. Intensifying educational programmes for continued support of girls' participation in all aspects of STI at the secondary school and tertiary institutions levels in order to counteract the effects of other negative factors, such as teenage pregnancies and traditional gender stereotyped attitudes towards science and technology.
- iii. Promoting the participation of disadvantaged groups in the development of STI programmes and provision of advice and information to these groups through NGOs and CBOs on capacity building in S&T including acquisition and use of technology.
- iv. Facilitating entrepreneurship training to disadvantaged groups to enhance their ability and capacity to utilise and commercialise technology.
- v. Introduce specific incentives to encourage and enhance participation of disadvantaged groups in STI.
- vi. Promotion of the use of books, magazines, pamphlets and other materials, with visual images and audio facilities that reflect a gender balanced involvement in STI.
- vii. Review and modification of regulations governing different aspects of STI to ensure

- equal participation of disadvantaged groups across all sections of society.
- viii. Encouraging the participation of disadvantaged groups in STI policymaking and implementation at all levels.
  - ix. Promotion of the use of role models to encourage participation of disadvantaged groups in all aspects of STI.

## **4.2 Build STI Sector Capacity for Generation and Transfer of Technology.**

### **4.2.1 Sector Financing and Investment**

#### **POLICY STATEMENT 6 :**

***Provide financial support for STI activities to build capacity and put in place the necessary infrastructure.***

#### **Strategic actions for implementation of the above statement include:**

- i. Increasing the STI sector allocations from 3% to at least 5% of the total Government expenditure per annum.
- ii. Increasing funding support to R&D from 0.28% to 1% of the GDP as recommended by the African Union.
- iii. Identifying and accessing complimentary funds from bilateral and multilateral sources to support STI development.
- iv. Attracting private sector participation and financial support to R&D and STI through various incentives.
- v. Creation of a national STI fund to support strategic S&T innovations, acquisition of IPR for local innovators and recognition of scientific excellence.
- vi. Encouraging STI institutions to generate funds by commercialising their services and products and to utilise the funds for promotion and expansion of STI activities.

### **4.2.2 Human Capital Development and Retention**

#### **POLICY STATEMENT 7 :**

***Build an educational and training system that produces human resources with capacity to generate and effectively apply STI based on contemporary and future needs of society.***

#### **Strategic actions for implementation of the above statement include:**

- i. Strengthening STI education at all levels of Uganda's education system with a view to producing an STI aware and literate society.

- ii. Production of a critical mass of STI graduates with adequate intellectual, practical and vocational skills to meet the labour requirements in the various STI sectors.
- iii. Nurturing and promoting STI education within the informal sector through adult literacy programmes.
- iv. Supporting and promoting basic research for capacity development and creation of a critical mass of appropriate professional human resources.
- v. Support to domestic production and maintenance of STI educational equipment and materials.
- vi. Improvement of welfare and working conditions of practicing scientists and engineers.
- vii. Establishment of facilities and centres of excellence for training, research and innovation for scientists and engineers.

#### 4.2.3 STI Infrastructure

##### **POLICY STATEMENT 8 :**

***Provide adequate and state-of-the art STI infrastructure to facilitate cutting-edge research and scientific innovations.***

##### **Strategic actions for implementation of the above statement include:**

- i. Establishment, operationalisation and maintenance of major national facilities for research and innovation.
- ii. Establishing and adequately equipping science laboratories in public research and training institutions.
- iii. Establishment of national and regional science parks to serve as nuclei for cutting-edge scientific and technological research and product development.
- iv. Encouraging increased private sector participation in the development of STI infrastructure.
- v. Establishment, operationalisation and maintenance of technical services in specialised areas such as metrology, standardisation, and calibration.
- vi. Establishing an electronic networking platform for STI information dissemination and knowledge sharing among Ugandan universities and centres of excellence.

#### 4.2.4 Research

##### **POLICY STATEMENT 9 :**

***Support basic, applied and development research for enriching the STI knowledge base and product development for enhancing indigenous knowledge and adaptation of imported technology.***

### **Strategic actions for implementation of the above statement include:**

- i. Promotion and enhancement of basic, applied and development research including research on culture, norms and values relating to STI development.
- ii. Support to local institutions for enhancing capacity to undertake research on strategic STI issues.
- iii. Establishment of national research priorities and sourcing funds for competitive research grants for both public and private institutions and individuals.
- iv. Provision of adequate public funds for national research programs and financial incentives for researchers thus reducing brain drain.
- v. Strengthening the existing and establishment of new R&D institutions in strategic areas of STI for accelerated national development
- vi. Strengthening and supporting training and enhancement of scientific research skills for undertaking reverse technology and indigenous technology development.
- vii. Supporting high quality scientific research that leads to commercialisation development of products from research results.
- viii. Strengthening collaboration with regional and international research institutions.

#### **4.2.5 Technology Incubation**

##### **POLICY STATEMENT 10 :**

***Support development and growth of small and medium enterprises through provision of essential services and infrastructure.***

### **Strategic actions for implementation of the above statement include:**

- i. Establishment and maintenance of science and technology parks with state-of-the-art infrastructure.
- ii. Support to researchers to develop prototypes from research results.
- iii. Establishment of central research infrastructure facilities to incubate commercially viable innovations.
- iv. Promotion and creation of innovative technology-based companies by assisting them to access funding facilities and viable partnerships.
- v. Provide entrepreneurial and business skills through training and consultancy.

### **4.3 Establish and Strengthen Legal and Regulatory Framework to Ensure Ethics and Safety in STI Development and Application.**

#### **4.3.1 STI Safety Regulations**

##### **POLICY STATEMENT 11 :**

***Apply appropriate safety and health measures in the generation, development and application of STI in all its aspects.***

##### **Strategic actions for implementation of the above statement include:**

- i. Development of policies, guidelines and regulations for unintended or detrimental effects of scientific and technological development.
- ii. Strengthening the research and clearance function of Government.
- iii. Improvement of facilities for adoption of best practices in generation and application of STI.
- iv. Promotion of regional and international co-operation on safety in STI.
- v. Development of national capacity for risk assessment and management of scientific and technological development.
- vi. Promotion and adoption of cleaner production technologies and practices.
- vii. Raising public awareness on safe use, application and disposal of STI products

#### **4.3.2 Ethics in STI**

##### **POLICY STATEMENT 12 :**

***Establish mechanisms to ensure development and application of STI in accordance with acceptable morals and national societal norms.***

##### **Strategic actions for implementation of the above statement include:**

- i. Establish acceptable ethical codes of conduct for undertaking STI applications.
- ii. Strengthen the ethical review system through establishment of Institutional Review Boards in all SETIs.
- iii. Streamline the procedures for research registration and clearance.
- iv. Enhance monitoring and field support for R&D programmes and activities.
- v. Establish a National Research Register.

### 4.3.3 Standards and Quality Assurance in STI

#### **POLICY STATEMENT 13 :**

***Promote the standardisation of Ugandan products and services in line with required international standards.***

#### **Strategic actions for implementation of the above statement include:**

- i. Strengthening institutional framework for enforcement of quality standards in the development and application of STI.
- ii. Establishment of laboratory testing systems for raw materials and manufactured goods for domestic and foreign markets.
- iii. Introduction of certification systems for products and companies.
- iv. Introduction of accreditation systems for both laboratories and company certification bodies.
- v. Development of national standards for all products to ensure orderly evaluation, selection, acquisition and adaptation of appropriate traditional and contemporary technologies.
- vi. Establishment of an information system on standards and quality.
- vii. Establishment of an import quality control mechanism to enforce minimum quality standards for Uganda.
- viii. Training personnel from industry, research and development institutions and government departments in standards and quality management.
- ix. Ensuring that all goods and services produced and sold in Uganda conform to the national standards.
- x. Promotion and use of sustainable technologies, which are environmentally sound and safe to the consumers.
- xi. Sensitisation of the public on processes and product quality and standards.

## **4.4 Strengthen the STI Coordination Framework to Enhance Sector Performance.**

### 4.4.1 Public Awareness and Appreciation of STI

#### **POLICY STATEMENT 14 :**

***Promote STI awareness and ensure public commitment and support for STI activities and programs.***

#### **Strategic actions for implementation of the above statement include:**

- i. Sensitisation of policy makers and the public about the critical importance of the STI sector for economic prosperity.

- ii. Lobbying and advocating for STI support by the executive, legislature and the public.
- iii. Creating an environment to promote and upgrade the status of STI in Uganda.
- iv. Organising and holding fora for policy makers, political leaders and stakeholders to regularly deliberate on topical STI matters.
- v. Conducting school visits to improve awareness and motivate young people to choose and develop careers that enable them to engage in STI.
- vi. Increasing STI literacy in order to facilitate its adoption and application in all the sectors of the economy.
- vii. Promotion of science journalism to communicate science, technology and innovation information in a manner that can be consumed by the Ugandan public.
- viii. Support to publication and marketing of reading materials such as books, research features, journals and periodicals of STI.

#### 4.4.2 Information Management System

##### **POLICY STATEMENT 15 :**

***Develop an STI information management system to facilitate the production, storage and dissemination of accurate, timely and up-to-date information on STI activities.***

##### **Strategic actions for implementation of the above statement include:**

- i. Establishment of an ICT network infrastructure to create an enabling environment for quality learning, research, management and business.
- ii. Increasing information management efficiency through open competition in the provision of information and communications services.
- iii. Development of information technology skills required for maintenance and provision of technology support services that make local enterprises globally competitive.
- iv. Promotion of access to STI information through public and private libraries with adequate stocks of STI reading materials.
- v. Promotion of national productivity and increased use of modern technology information systems within public and private sector.
- vi. Development of national on-line database systems on the broad spectrum of the economy as part of the e-government strategy for STI system.
- vii. Establishment of a national STI resource centre and information management system for decision support and performance monitoring.
- viii. Strengthening and networking information units of the existing STI institutions.

#### 4.4.3 Sector Coordination and Partnerships

##### **POLICY STATEMENT 16 :**

***Strengthen the central co-coordinating institution – (UNCST) – to effectively provide a sector-wide framework for policy, planning and coordination; and establish support linkages with local, regional and international development partners.***

##### **Strategic actions for implementation of the above statement include:**

- i. Strengthening institutional capacity of the Uganda National Council for Science and Technology to effectively coordinate the formulation and implementation of STI policies and programmes.
- ii. Streamlining the institutional framework for STI to enhance coordination and synergies in implementing STI activities and programmes.
- iii. Establish STI inter-institutional mechanisms for information sharing and collaboration in implementing STI activities.
- iv. Promoting linkages between sectors and among stakeholders by fostering public-public, public-private and private-private partnerships in research and innovation, product development and commercialisation.
- v. Gazette a National Science Week as a public forum for review, discussion and dissemination of national STI activities, outputs and programmes.
- vi. Participating in appropriate and beneficial STI fora and programmes both regionally and internationally.
- vii. Collaboration with countries that are advanced in STI.
- viii. Development of partnerships for exchange of human, intellectual and physical resources desired to promote STI in Uganda.
- ix. Enhancing international partnerships and cooperation in STI.

## 5.0 SUPPORT FOR STI POLICY IMPLEMENTATION

The key areas that need support for implementation of the STI policy include sector policy and planning, sector financing and investment, sector regulation, institutional framework, sector coordination, and monitoring and evaluation.

### 5.1 Sector Planning

A National Science and Technology Plan (NSTP) shall be developed using a sector-wide and participatory approach in line with the principles, objectives and strategies provided in this policy. The NSTP will elaborate the policy actions, provide short-, medium- and long-term priorities and targets for the sector in tandem with the goal and objectives of the National Development Plan (NDP). It will provide a broad framework for development of STI and will be regularly reviewed to incorporate new developments in the sector.

### 5.2 Sector Financing and Investment

Implementation of the STI policy will build on current Government of Uganda's commitment for development and support to the STI sector although more funding commitments in the short-, medium-, and long-term are needed. While the bulk of resources can be obtained from the current sector allocations, new funding sources for long-term development of the sector are required to build on the available US\$ 33.35 million under the Millennium Science Initiative (MSI) Project for the period 2007/08 – 2010/11. The science, technology and engineering institutions (SETIs) which are responsible for implementing this policy will budget for and directly access STI funds through their sectoral budgeting processes. The initial five year cost forecast for facilitating the STI policy implementation by UNCST is estimated at US\$ 830 billion in accordance with implementation strategy of the National Development Plan. A contribution of US\$ 56.5 billion has already been availed thus reducing the funding requirement to US\$ 773.5 billion.

In addition to current financial commitments to R&D through support to SETIs, Government will endeavour to fully operationalise an STI fund with up to 1% of the GDP over the medium term, to finance scientific research and innovations of strategic national importance, acquisition of intellectual property rights by local innovators, and recognition of scientific excellence by Ugandan researchers and scholars. To this end, Government has already been allocating US\$ 8 billion annually since FY 2007/2008 towards Banana Industrial Development, Malaria Research and other technological development efforts by distinguished local researchers. Furthermore, Government will continue to explore mechanisms for increasing both foreign and local investment in STI by fostering private-private and public-private sector partnerships for increased financing of the sector.

### **5.3 Sector Regulation**

Government will, within the provisions of this policy, enact enabling regulatory measures to guide and promote the STI sector development. However, implementation of this Policy will initially rely on the existing legal framework within the STI sector followed by a review of the obsolete provisions of the national STI legislations, the UNCST Statute and the associated laws therein, especially in regard to research and development, intellectual property and biosafety among others.

### **5.4 Institutional Framework**

Implementation of the STI Policy is a joint responsibility of several SETIs within the national STI sector, with UNCST as the overall sector coordination agency. The other implementing agencies will include R&D institutions, academic institutions, regulatory institutions, policy institutions, central government ministries and departments, local governments, private sector, civil society, and NGOs whose activities relate to STI. The institutional framework for the STI sector will be strengthened for effective implementation of the STI policy. The roles and function of each of the above stakeholders in the STI sector will be as provided for within their institutional mandates and as elaborated in this STI Policy.

### **5.5 Sector Coordination**

The STI sector coordination framework will be strengthened to provide a mechanism for effective sector-wide planning and coordination. The framework provides for participation of Government Ministries in the STI sector, local government, higher education sector, private sector, and civil society. This will ensure a balanced approach to STI sector development and coordination of stakeholder involvement. An STI consultative forum will be established to allow the public, development partners and other stakeholders to engage in regular dialogue on STI, improve sector coordination and facilitate national STI priority setting, planning and review.

#### **5.5.1 Demarcation of Roles**

The institutional roles and responsibilities in implementation of this Policy are in line with the mandates of stakeholders outlined in the following sub-sections.

##### **5.5.1.1 Central Government**

The Central government will formulate policies, enact regulations and provide adequate financing for implementation of STI policies and regulations. It will also provide an appropriate institutional framework for policy implementation and performance monitoring and evaluation. The Government will collaborate with several regional and international bodies in implementing various strategic actions proposed in this Policy. The Government shall take advantage of the proposed East African Commission for Science and Technology (EACST), the New Partnership for Africa's Development (NEPAD), and other international STI initiatives to strengthen international collaboration on STI.

##### **5.5.1.2 SETIs**

The science, engineering and technology institutions will implement the STI policy through appropriate programmes and projects as provided for by their institutional mandates.

#### 5.5.1.3 Local Government

In accordance to the Local government Act (1997) for devolution of powers from the central government to the district and other lower councils, the Local governments will ensure participation of the local communities and districts in the formulation, implementation and monitoring of STI activities.

#### 5.5.1.4 Private Sector

The private sector shall initiate and finance programmes and projects for implementation of the STI policy in partnership with the government, NGO, SETIs and civil society.

#### 5.5.1.5 NGOs and CBOs

The NGOs and CBOs shall develop and finance programmes and strategies for STI implementation in line with their missions and development priorities. They will also advocate for the participation of the special interest groups and disadvantaged groups in STI activities.

#### 5.5.1.6 Local STI Communities

The local communities will participate in the initiation and implementation of community-based STI programmes and provide feedback on appropriateness and effectiveness of the programmes in addressing societal problems within the national development framework.

#### 5.5.1.7 Development partners and international community

Development partners are expected to contribute to financing the implementation of this Policy in line with their development cooperation priorities. The international community is also expected to support best practices in management of the STI system in Uganda.

## **5.6 Monitoring and Evaluation**

Government shall, within the provisions of this Policy, continuously monitor and evaluate the STI sector's performance using parameters provided in the relevant STI Policy statements and the National Integrated Monitoring and Evaluation System (NIMES) framework.

The government will establish a well-defined information management system, with reliable STI indicators and statistics that facilitate performance monitoring and impact evaluation over the short-, medium-, and long-terms. The reports of the STI sector monitoring and evaluation will be published regularly and serve as a tool for STI sector policy development and review.