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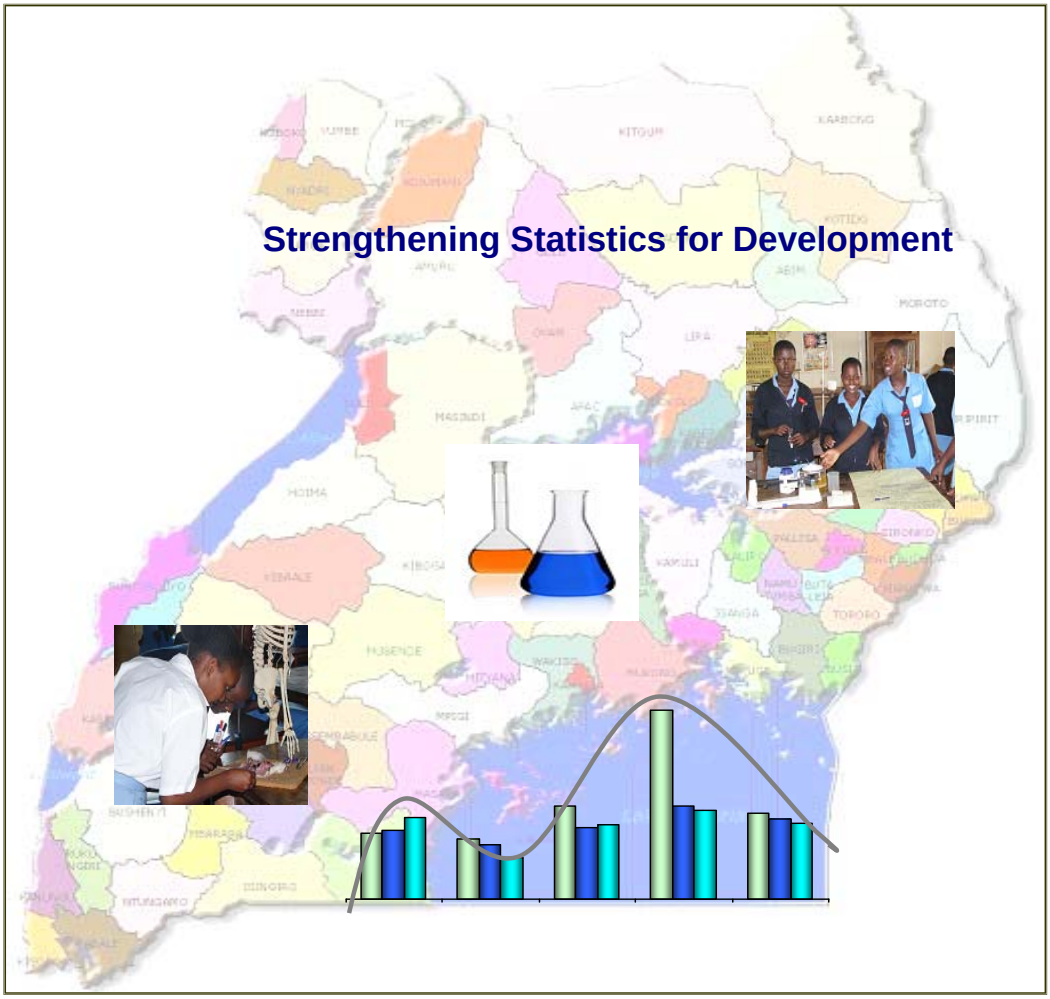

SCIENCE AND TECHNOLOGY

SECTOR STRATEGIC PLAN FOR STATISTICS

2007/08-2011/12

UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Sector Strategic Plan for Statistics

2007/08-2011/12

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TABLE OF CONTENTS

ACRONYMS

AES	Assistant Executive Secretary
EDPR	Economic Development Policy Research
EMIS	Education Management Information System
HCDU	Human Capital Development Unit
HMIS	Health Management Information System
IGG	Inspector General of Government
IT	Information Technology
LIS	Library and Information Services
LOGICS	Local Government Information and Communication System
M&E	Monitoring and Evaluation
MFPED	Ministry of Finance, Planning and Economic Development
MIS	Management Information System
MTCS	Medium Term Competitive Strategy
NGOs	Non Governmental Organizations
NSTP	National Science and Technology Policy
OECD	Organization for Economic Cooperation and Development
PCD	Policy Coordination Division
PEAP	Poverty Eradication Action Plan
R&D	Research and Development
S&T	Science and Technology
SSPS	Sector Strategic Plan for Statistics
SETIs	Science, Engineering and Technology Institutions
SIP	Scientific and Industrial Policy
SSPS	Sector Strategic Plan for Statistics
STE	Science and Technology Expenditure
STO	Science and Technology Outreach
UBOS	Uganda Bureau of Statistics
UIS	UNESCO Institute of Statistics
UNCST	Uganda National Council for Science and Technology
UNESCO	United Nations Educational Scientific and Cultural Organization

FOREWORD

The Uganda National Council for Science and Technology (UNCST) is mandated to facilitate and coordinate the development and implementation of policies and strategies for integrating Science and Technology (S&T) into the national development process. The Government has through the UNCST supported the growth of the S&T sector in Uganda, as a critical ingredient in achieving UNCST's vision of a prosperous S&T-led Ugandan society.

In order to realize the above mandate and to scale up the current national S&T development efforts, it is necessary to generate evidence-based and reliable S&T statistics for the formulation of appropriate S&T policies and development of S&T plans and programmes to promote sustainable development. The Plan for National Statistical Development (PNSD) therefore provides an integrated framework, for strengthening statistical capacity across the entire National Statistical System (NSS), within which different stakeholders will generate, disseminate and use statistics that provide a sound basis for sustainable national planning. The Strategic Plan for S&T Sector Statistics (2007/08-2011/12) which is a component of the PNSD provides a basis for continually improving S&T data and information within the framework of the national S&T statistical system.

The UNCST appreciates the efforts and input of all those who participated in the formulation of the Strategic Plan for S&T Sector statistics, particularly the management and staff of the UNCST and technical support consultants. We also acknowledge the contribution from all stakeholder institutions within the national S&T system, including Ministry of Finance, Planning and Economic Development, and other government agencies and Development Partners. The UNCST is most grateful to the Uganda Bureau of Statistics (UBOS) for spearheading the development process of the PNSD and looks forward to their continued collaboration

Dr. Peter Ndemere

EXECUTIVE SECRETARY
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

EXECUTIVE SUMMARY

The formulation of Science and Technology (S&T) policies and the development of S&T plans and programmes for the promotion of sustainable development and innovation require reliable and comprehensive data on a country's scientific and technological potential as well as its resource base. This plan highlights the significance of statistics in creating an enabling environment for national development. Quality statistics are needed for formulating effective policies, tracking achievement of development outcomes, and informing the decision making process. The plan has been developed through a consultative process with major stakeholders.

A situation analysis assessed the relation between the stakeholders and UNCST and the activities stakeholders are involved in, including status of data production and use; and the quality of data produced. The formulation of strategic objectives and strategies for improving statistical development in the organization was informed by a SWOT analysis. The **Vision** of the plan is **to "be a coherent, reliable, efficient and demand-driven S&T statistical system**". The **Mission** is **to** "**produce good quality statistics for evidence-based decision making, planning and management in the S&T sector**". The three strategic objectives of the plan include: Coordination and Management, Human Resource Development and Management and the Statistical Development Programmes for data production.

Budget

This plan has been costed at 2.92 billion Uganda shillings, an equivalent of USD$ 1.46 million over a five year period as summarized in the table below:

S&T SSPS Budget (Uganda Shillings "000")

Strategic Area	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Coordination and Management	27,000	264,000	146,000	75,000	10,000	522,000
Human Resource Development and Management	45,000	297,500	320,000	260,000	170,000	1,092,500
Statistical Development Programs	206,780	305,280	305,280	245,280	245,280	1,307,900
Total	**278,780**	**866,780**	**771,280**	**580,280**	**425,280**	**2,922,400**
USD $	**139.39**	**433.39**	**385.64**	**290.14**	**212.64**	**1,461.2**

US$=2,000 Uganda Shillings

1.0 BACKGROUND

1.1 Mandate and Functions of UNCST

The Uganda National Council for Science and Technology (UNCST) is a semi-autonomous government agency established in 1990 by an Act of Parliament (CAP 209). It is mandated to facilitate and coordinate the development and implementation of policies and strategies for integrating Science and Technology (S&T) into the national development process.

The statutory functions of the UNCST include the following:

(i) advise on and coordinate the formulation of an explicit national policy on all fields of science and technology;
(ii) assist in the promotion and development of indigenous science and technology;
(iii) assist in the rationalization of the use of foreign science and technology;
(iv) act as a clearing house for information on research and experimental development taking place in scientific institutions, centres and other enterprises and on the practical application of results;
(v) protect intellectual property through appropriate patent laws;
(vi) disseminate R&D findings through seminars, workshops, and publication of journals;
(vii) recognize and honour scientists and technologists through awards or presentations for outstanding achievements in science and technology;
(viii) work in close cooperation with and coordinate all scientific and technological activities of persons, institutions, sectors and organizations;
(ix) draw up estimates for the implementation of the national science and technology policy; and
(x) review and advise on programmes and budgets for the promotion of science and technology.

1.2 S&T in the Economy

Science and Technology are critical to sustainable socio-economic growth and transformation of Uganda. The Government of Uganda recognizes the key role S&T play in fostering Research and Development (R&D) and in building the human capital that Uganda requires for the future knowledge-based 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 S&T.

Developed and emerging industrialized countries spend two to three percent of their GDP on research and development; the estimated figure for Uganda averages between 0.2 and 0.3 percent[1]. It is essential to accord high priority to scientific and technological development needs in the overall socio-economic development strategy of the country. S&T are envisaged to contribute effectively to diversification of the economy and sustainable use of natural resources. Some of the contributions of S&T include:

Economic Growth: Industrialized countries have grown faster than developing countries over time, because of higher investments in S&T that has led to increased firm level productivity resulting in high GDP growth rates.

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

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 increase 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.

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.

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 contributed 54.4 percent of total GDP in 1998 (UEPB, 2004).

Science Tourism: Science 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 percent was from tourism (UEPB, 2004).

1 Review of State Expenditure on Science and Technology and Research and Development in Uganda, 2002/2003 - 2005/2006.

S&T and Rural Livelihoods: Science, technology and innovation play a significant part in shaping the livelihoods of the rural folks who 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 social economic well-being of the rural population which currently stands at over 70 percent (UBOS, 2005). A significant proportion of the 31 percent of Uganda's population that is below the poverty line, that reside in rural areas. This is largely due to low levels of STI development in rural Uganda.

1.2.1 Outlook on S&T Statistics and Indicators in Uganda

The UNCST is the coordinating body for S&T activities in Uganda, including the collection and generation of S&T statistics and indicators. As such, the Council is involved in a number of S&T programs and/or activities related to statistics and indicators. The formulation of Science and Technology (S&T) policy and the development of S&T plans and programmes for promotion of sustainable development and innovation require up-to-date, reliable and comprehensive data on a country's scientific and technological potential as well as its resource base.

S&T indicators show the trends of S&T activities and their impact on socio-economic development. They describe the S&T system, the structure and its impact on society as well as the economy. Indicators for S&T are defined as "*statistics which measure quantifiable aspects of the creation, dissemination and application of science and technology.*"[2] S&T indicators inform policy formulation, implementation and monitoring of programmes. Systematic and appropriate S&T statistics and/or indicators provide an indication of the status of the national S&T system, and the relationship between S&T efforts and economic growth. The indicators also promote greater acceptance and appreciation of science by politicians, policy makers and the general public. The understanding of S&T information ensures also that no undue social effects are produced by advances in S&T.

The development of the Sector Strategic Plan for S&T Statistics is intended to provide a strategic direction for the production of S&T statistics in the country. Since 1990 the UNCST has been working towards strengthening national capacity for the collection and management of S&T statistics. In 1997, United Nations Economic Commission for Africa (UNECA) supported the development of appropriate S&T indicators for Uganda. The key challenge faced in the compilation of S&T indicators for Uganda was scarcity of relevant S&T data.

[2] Martin B. Wilk (1996), Statistics Canada, A Framework for Measuring Research and Development Expenditures in Canada, catalogue 88-506E, preface.

Due to limited human and financial resources to conduct independent national S&T surveys, efforts were made to integrate the collection of S&T statistics with the 2002 Population and Housing Census (PHC), and subsequent Demographic and Household surveys conducted by the Uganda Bureau of Statistics (UBOS).
The surveys enabled generation of two-digit statistics on S&T phenomena. However, specific and in-depth surveys are required to generate four digit statistics that are necessary for policy.

UNESCO Institute of Statistics (UIS) has been providing technical assistance over the last decade to the UNCST and some of its partner institutions (Ministry of Education and Sports, National Council for Higher Education, National Planning Authority etc.) in the collection of S&T statistics and related indicators. These efforts have resulted into increased capacity in the compilation of S&T statistics in Uganda and adherence to international standards/guidelines. Most elements in the data guidelines are applicable to developed and developing country systems, although these need to be customized to local conditions.

1.2.2 S&T Statistical System in Uganda

Uganda has a decentralized statistical system. Although the Uganda Bureau of Statistics, the National Statistics Office, is the principal agency mandated to produce and disseminate official statistics, other line Ministries, Departments and Agencies (MDAs) produce statistics relevant to their mandates. UBOS also coordinates, supervises and monitors data production programmes in the NSS so as to minimize duplication of efforts and ensure optimal utilization of resources.

Uganda has an under developed S&T statistical system for the production of S&T indicators. However, some few institutions generate S&T data within their mandates to inform the S&T policy for Uganda.

The UNCST periodically undertakes surveys to collect S&T data from the various stakeholders. Data is compiled from institutional reports and use of questionnaires. The Council uses the data to develop national administrative sources, which include text-based databases and directories on: research projects; research publications; researchers and scientists in Uganda; research, science and technology institutions in Uganda; status S&T innovations; and S&T financing.

1.3 Significance of S&T Statistics and Indicators

Over the past 2-3 years there has been a growing need in Uganda for an information system and database on S&T statistics (popularly known as "Science Statistics").

Policy makers engaged in planning, implementation and management of S&T demand for comprehensive information on;

- the availability and use of financial, human resources and infrastructure for S&T activities
- outputs from S&T activities measured in terms of increased productivity, economic growth and use of new technologies and
- impact of the activities on society.

This information is useful for undertaking cost benefit analysis and other economic studies, as well as programming, planning and budgeting. It is also important for comparing national S&T efforts with those of other developed and developing countries.

S&T statistics and indicators generated through the Plan will fulfill several data requirements namely:

(i) ***Signaling or monitoring*** - providing insight into and calling attention to developments and trends in the S&T system and its development;

(ii) ***Accountability, evaluation and allocation*** - setting and justifying S&T budgets and providing insight into the performance of the S&T system against the goals established by policy makers and planners;

(iii) ***Legitimization*** – giving support to existing policies; and,

(iv) ***Awareness creation*** - providing information to correct prejudices of the performance of the S&T system.

In the public sector, statistics on S&T inputs and outputs, and the consequent S&T budgets, will support the;

- Formulation of S&T policy to support economic and social objectives;
- Analysis of the national system of innovation;
- Provision of advice to policy makers and implementers;
- justification of S&T program expenditures; and,
- Information on scientific activities to S&T stakeholders.

1.4 Process of developing the Plan

The S&T Sector Strategic Plan for Statistics (S&T-SPSS) was developed as an input into the Plan for National Statistical Development (PNSD). The PNSD provides a framework for strengthening statistical capacity across the entire National Statistical System (NSS) for results-based management. The development process of the S&T-SSPS was spearheaded by the UNCST Statistics Unit centrally located within the Division of S&T Policy and Coordination.
In preparing the S&T SSPS, the UNCST made close reference to sector analyses conducted by the Government of Uganda and the World Bank during the period 2004/2005 on the status of various aspects of the S&T system.

The analyses identified a number of areas that the Plan seeks to address, including: S&T policy formulation, human resource development and capacity building, S&T infrastructure and services, S&T financing, technology promotion and public awareness, and performance monitoring and evaluation. The Plan was developed by UNCST in close collaboration with stakeholders in the public and private sectors. During the preparatory phase, the PNSD UNCST contact person for statistics participated in the Strategic Planning Workshop for the Development and Management of Statistics in Uganda organized by the Uganda Bureau of Statistics. Subsequently, the PNSD and SSPS concepts were introduced to the UNCST management, and a Sector Statistics Committee (SSC) was constituted.

The SSC mainly comprising of staff from the S&T Policy and Coordination Division, designed the roadmap and initial draft of S&T statistics plan which was reviewed by senior management. The second draft was designed with technical assistance provided by UBOS and presented at the Inter-Agency Committee meeting. The third and final drafts of the S&T sector strategic plan for statistics was reviewed and approved by the UNCST Board and specialized technical committees representing various sectors of science and technology, with the guidance of technical and international consultants. The Plan was further enriched by input, based on formal and informal consultations, from the key S&T producers and users under the guidance of the Uganda Bureau of Statistics.

1.5 Structure of the Plan

The S&T SSPS is presented in six sections. Section one gives the background information, while section two provides a situational analysis of the S&T sector. The third section addresses strategic issues of the sector including the vision, mission and strategic objectives. The strategy for improving the production, storage and dissemination of S&T statistics is highlighted in section four. Section five presents the implementation plan while section six covers the annexes.

2.0 SITUATIONAL ANALYSIS

Uganda's S&T statistical system based on the UNCST Statute No. 1 of 1990 (CAP 209 of the Laws of Uganda), is meant to efficiently and effectively produce S&T statistical data. In order to accomplish this, the following six steps have to be taken:

(i) assessment of needs and resources
(ii) synchronization between needs and resources
(iii) coordination and integration of work
(iv) planning and standardization
(v) specialization of the program and
(vi) program implementation.

This section provides a situational analysis of the Uganda's S&T statistical system highlighting: an analysis of stakeholders in the system; the current status for data production, storage and dissemination; and an indication of the quality of data produced.

2.1 Organizational Development and Management

The statistics function at the UNCST is handled under the Division of S&T Policy and Coordination as indicated in the organogram (Annex F). The Statistics Unit of the Council is mandated to provide accurate, timely and reliable S&T data to inform policy formulation, planning, and monitoring and evaluation processes within the overall national development framework. The Unit aims at:

- Coordinating, supervising and monitoring the National S&T Statistical System;
- Providing relevant and timely S&T sector information;
- Designing and implementing S&T surveys;
- Maintaining a comprehensive database for the S&T sector.

The core tasks and products of the Statistics Unit include:

- Collection of S&T statistics and indicators.
- Periodic production of national S&T Indicators and Status reports.
- Provision of S&T data to the S&T stakeholder community for planning and research purposes.
- Provision of S&T statistics as a contribution to the UNESCO Institute of Statistics (UIS) for M&E purposes and international comparisons.
- Research Registration and Clearance.

The Statistics Unit has over the years evolved from an S&T statistics desk to a fully fledged unit with seven members of staff, five computers performing basic secretarial and administrative work for the Unit instead of specialized statistical data analysis. There has not been an explicit budget for S&T statistical activities such as S&T surveys, S&T tracer studies, and S&T policy studies.

In the recent years, this budgetary scenario has had far reaching implications, in terms of outputs and outcomes, the existing statistical infrastructure, human resource capacity and scope of S&T statistical activities.

2.2 Stakeholder Analysis

Uganda's national S&T statistical system consists of all individuals and organizations involved in producing and using S&T-related statistics to inform policy formulation and M&E processes. The beneficiaries of the S&T statistics are a cross-section of individuals and institutions, local and foreign, whose activities affect and impact on the overall S&T system. The entire S&T community is primary beneficiaries of S&T statistics. These include:

i). Government
ii). Development Partners
iii). Science, Engineering and Technology Institutions (SETIs)
iv). Private Sector – Firms, Enterprises, Industries, and Businesses
v). The Higher Education Sector
vi). Non-Governmental Organizations
vii). Local Governments
viii). Civil Society
ix). Researchers and students.

The S&T stakeholder community is important for production and use of statistics and as inspectors of the integrity of S&T statistics and indicators. S&T data priorities are determined by standard S&T indicators (such as R&D resource allocation, S&T human capacity development & training, STE workforce, scientific literature and technological terms of trade and balance of payments) and national development priorities as outlined in the National Development Framework (NDF), the Medium-Term Competitive Strategy (MTCS), and the National Science, Technology and Innovation Policy. The stakeholders in various ways participate in the identification of data priorities, collection and utilization of S&T statistics. The UNCST collects macro statistics for each of the above and other relevant indicators mainly through document analysis and administrative action.

These are aggregates on the key S&T indicators that are most useful for stakeholders in the area of macro policy and international comparisons. Micro data for household and other intermediate level decision making by the enterprise sector largely remains unavailable.

Table 1 below summarizes the role of key stakeholders in the S&T monitoring framework

Table 1: Stakeholder Matrix

Institution	Role in S&T monitoring framework
MFPED, EDPR Department	Coordinates the overall national data collection and analysis exercise
MFPED, Budget Department	Monitors public expenditure
MFPED, Macro economic Department	Monitors and projects macroeconomic indicators
UNCST	Coordinates national S&T data collection; monitors and project S&T indicators
UBOS	Conducts censuses and surveys (official economic statistics) for national planning
Sectoral Ministries (Planning Units)	Design indicators and collect administrative data on service delivery and outcomes in the sector; analyse data in conjunction with other data sources.
Districts Authorities	Develop S&T databases at district and community level; collect information on outputs and inputs
Development Partners	Provide support to national development efforts
R&D Institutions and NGOs	Conduct research on all aspects of science and technology using official and privately generated data
IGG, Auditor-General	Ensure prudence and transparency in resource utilization.

2.3 Status of data production.

The production of statistics at UNCST follows a well-known logical sequence, which is common to most statistical applications. This process has four major stages:

(i) ***Data Collection*** or ***Data Transmission*** (receiving and storing data);

(ii) ***Data Validation*** (verifying, filtering and correcting data);

(iii) ***Statistical production*** (imputation, estimation, aggregation, data analysis, seasonal adjustment, etc.); and,

(iv) ***Data Dissemination*** (preparing publications and public datasets, publishing data and documents, selling products, etc.).

The UNCST produces S&T statistics mainly through administrative action and surveys. However, no comprehensive national S&T survey has been undertaken in Uganda; the surveys that have so far been conducted are pilot and sector focused. Therefore, there is lack of complete and consistent S&T data in most institutions and/or sectors comprising the national S&T system. Oftentimes, survey and administrative data have been inconsistent and not produced in a timely manner.

Data produced is stored on PCs and back-up storage facilities such as floppy disks and CDs. These storage devices have limited capacity and are highly unreliable.

The council generates annual statistical reports that are published and disseminated to key stakeholders within the S&T system. A lot of data that are generated within the S&T sector are not fully disseminated and readily accessible for general use in user- friendly formats. There is inadequate statistical, physical and other related supportive infrastructure for the effective and efficient production, storage and timely dissemination of quality science and technology (S&T) statistics.

The Statistics Unit of the UNCST is inadequately resourced to effectively undertake the statistics function. The Unit currently has weak links to other sector statistics units. There are significant human resource capacity challenges pertaining to skills and numbers that do not permit efficient and effective production and management of S&T statistics.

The Budgets allocated to statistics are inadequate. About 10 percent of the annual institutional budget is allocated to statistics activities, which significantly impinges on the existing facilities and equipment for the statistics unit as well as staff motivation. The Unit is therefore, unable to adequately respond to emerging S&T data needs.

Due to weak networking and collaboration coupled with low public appreciation of S&T statistics, there is limited use of sound and internationally accepted statistical techniques for production and management of S&T data within the S&T system.

2.4 Quality of data

Data priorities in the S&T sector are determined by: the mandates of the S&T stakeholder agencies, the need to monitor progress and performance of government S&T initiatives, available resources, and demands from clients such as UNESCO, OECD, World Bank and MFPED, and institutional needs

In terms of existing S&T statistics and indicators, persistent efforts have been made by UNESCO to promote the systematic measurement of S&T and to collect and disseminate cross-national statistics and indicators on S&T. By following a systems approach of input-process-output-impact, traditional S&T input indicators are based on the measurement of the expenditure incurred and the personnel devoted to R&D activities or to Scientific and Technological Activities (STA). The UNCST is able to produce relatively good S&T data and statistics of the following description: human resources in S&T, financial resources devoted to S&T and R&D, bibliometrics (patents registered & no. of publications), and public appreciation of S&T. However, a large amount of data has quality problems.

The low appreciation and utilization of science and technology together with inadequate financial allocations within the various science and technology sectors affects timeliness in the production and dissemination of S&T statistics and indicators to relevant users.

Appreciation of S&T-related statistics by decision makers and the general public at different levels and across society is still inadequate. This has often resulted into limited demand and national level support for S&T statistics, and has impinged on the perceived relevance of S&T statistics in informing the policy and planning processes.

The production of S&T statistics and related indicators is dependent on the effectiveness and efficiency of other statistical units within the overall S&T system. This further spreads the responsibility of the quality of statistics to other producers especially with respect to accuracy, completeness, consistency and timeliness.

While the UNCST is solely responsible for the quality of the primary data it produces, quality assurance for other S&T statistics is a responsibility of other S&T-related sector institutions. There is no standardised methodology for collection of S&T-related statistics by different agencies, which negatively impacts on the consistency of the data generated.

On many occasions, the S&T data generated by UNCST are based on administrative records. These records provide statistics/indicators on registered research activities and their associated personnel and budget estimates while statistics on other S&T indicators such as scientific innovations and output, education and training, trade and industrial development are generated by the respective sectors.

The application of input-output indicators in developing countries such as Uganda faces many conceptual and methodological weaknesses. UNESCO's experience shows that currently, statistics on human and financial resources devoted to R&D are available for about seventy countries in the world, including some 30 developing countries, and the available data are of variable quality. The quality of the data and statistical products produced by the UNCST varies from indicator to indicator.

Table 2 below shows how UNCST stakeholders view the quality of S&T data and statistics produced by the Council. The attributes of relevance, accuracy, completeness, consistency, and timeliness were analyzed using scores on the scale of 1 to 5, where one is lowest and five is highest.

Table 2: S&T Indicators currently available and their quality dimensions

Indicator	Advantages	Disadvantages	Data Quality
Research and Development (R&D) R&D is measured according to allocated expenditures and human resources input (Methodological basis: FRASCATI Manual)	- Generally applied in a number of countries - Standardized historical series	- Classifications need updating (field of science, source of funding, etc.) - Variable coverage of sectors depending on national systems - Difficulty in understanding certain concepts (PT, FT, FTE) - Difficulty in distinguishing R&D activities from other related activities	Relevancy [**1**] Accuracy [**1**] Completeness [**3**] Consistency [**3**] Timeliness [**3**]
Human Resources in Science and Technology Measured in terms of science education and training according to levels and fields (Methodological basis: CANBERRA Manual)	- Based on international classifications recognised by ISCED - Statistics are regularly collected by education systems	- Difficulty in obtaining data regarding on-the-job and continuous training - Difficulty in "measuring" correspondence between people's employment and their training - Difficulty in estimating time occupied in R&D (EFT) and in other S&T activities.	Relevancy [**1**] Accuracy [**1**] Completeness [**3**] Consistency [**3**] Timeliness [**4**]
Innovation Measurement of activities leading to technological innovation (Methodological basis: OSLO Manual)	- Regular surveys on innovation are conducted in European countries with fully developed innovation systems -The Oslo manual underlines standards used to measure innovation	- Innovation activities can be difficult to measure - Concepts are not always clearly understood - Difficult to apply in countries which do not have statistical system on industries and business	Relevancy [**1**] Accuracy [**3**] Completeness [**3**] Consistency [**2**] Timeliness [**2**]
Publications Measurement of the level of production and dissemination of S&T knowledge	- Citations are the only indicators for the measurement of the diffusion of scientific knowledge	- There is no reference manual - Coverage of countries is incomplete - The quality of publications is not taken into account - Quotes do not measure the quality of publications	Relevancy [**1**] Accuracy [**1**] Completeness [**2**] Consistency [**1**] Timeliness [**1**]

Indicator	Advantages	Disadvantages	Data Quality
Patents Measurement of inventions	- The number of patents requested and issued is easily accounted for	- Low percentage of patented inventions - Number of patents does not inform on the importance of inventions - Commercial value of inventions unknown	Relevancy [**1**] Accuracy [**1**] Completeness [**1**] Consistency [**1**] Timeliness [**1**]
Impact Balance of technological payments; High technology industries (Balance of trade); Dissemination of technologies; Scientific culture	- Allow us to measure economic impacts	- Are mostly limited to the economy, do not take into account socio-cultural and political aspects - Require well developed and transparent accounting systems	Relevancy [**1**] Accuracy [**1**] Completeness [**2**] Consistency [**2**] Timeliness [**2**]

2.5 Dimensions to address existing Data Gaps

Depending on national conditions, concerns and needs, S&T activities can be measured across different policy dimensions and activity areas. However, there is need to develop an appropriate strategy in line with policy priorities. Based on the perceived S&T policy concerns, a number of indicator areas can be proposed for international measurement:

2.5.1 Education, training and human resources in S&T

Education remains the main avenue for building human resources in S&T in developed and developing countries. Science and technology education are organized in formal schools and colleges, but can also take place in informal settings like the workplace or through the mass media and advocacy programmes of scientific bodies. Because women continue to be under-represented among students and graduates in science and technology, there is need to systematically monitor gender imbalances in S&T human resources. This would involve questions such as:

- Are the current statistics for higher education adequately measuring individuals' qualifications and stock of human resources in S&T (according to field of education)?
- Are the current statistics for higher education adequately measuring employment by occupation in S&T?
- Are the current educational and occupational classifications adapted to the needs of S&T decision makers?
- How can one measure S&T education and training that take place in informal settings?
- What information is needed to measure the migration of S&T human resources (the brain drain)?

2.5.2 Scientific culture

One of the essential conditions for deriving full benefits from S&T development is a positive scientific culture amongst the population in general, and decision-makers in particular. Societies not only need citizens who can fully participate in applying and generating S&T knowledge and products, but also those capable of understanding scientific principles and laws governing nature and the environment so as to conscientiously contribute to sustaining them. Equally important is the need for managers who invest in S&T in judicious ways.

There have been attempts to gauge the level of S&T knowledge among persons of different gender, age-group and other social, economic, ethnic, linguistic characteristics, through the use of sample surveys and test measurement.

Can scientific culture be measured? If yes, how best can it be measured? Are such measures pertinent in developing countries like Uganda? If not, how can we develop ways to indirectly gauge scientific culture?

2.5.3 R&D capacity

R&D reflects a country's capacity to generate S&T knowledge. It is a key area in the measurement of S&T. R&D statistics have focused on input factors such as financial, human resources and physical infrastructure. Networking of people and institutions, nationally and internationally is an important element in R&D. Better measurement of the outputs and benefits of R&D have yet to be developed. Are the standard indicators on R&D (expenditure and research personnel) deemed essential in developing countries like Uganda? Can we consider it adequate as a measurement of scientific and technological activities which include more than R&D? What other kind of S&T activities should be and can realistically be measured? Are the following R&D dimensions subject to common definitions which can be applied across different countries?
(i) fundamental research/applied research/experimental development
(ii) sectors: universities, governments, business, non-profit organisations
(iii) classifications: according to fields of science; industries; socio-economic objectives; sources of funds; FT/PT/FTE, etc.

2.5.4 Innovation

In modern economies, innovation is a decisive factor of economic growth. In developed countries, it is the business sector that performs the major part of innovations. In Uganda, the innovation activities under the business sector are less organised and this affects data collection from private enterprises. This situation calls for surveys on innovation for Uganda. However, there is need to explore whether R&D can be combined with innovation surveys.

2.5.5 Output

Over the last twenty years, governments have required evaluative mechanisms of research activities. Various indicators have been used over recent years to measure the quantity of output of scientific and technological activities, notably the number of publications and number of patents. Are these indicators relevant as a measure of research output from developing countries like Uganda? Are they biased towards so-called advanced scientific and technological systems? What specific output should we then measure at the international level, and how should this be done.

2.5.6 Knowledge and technology transfer

Alongside the endogenous generation of S&T knowledge, international transfer and cross-fertilization of technologies and knowledge have become essential to the S&T development of any country. The economic success of today's greatest power is due to the free exchange of scientific ideas and technological advances that occurred since the last century. It is therefore important to measure developing countries' level of access to, absorption, adaptation and application of S&T knowledge from developed countries. What is the significance of the measurement of knowledge transferred to (and from) developing countries like Uganda? Do such statistics allow for the measurement of both the movement as well as the capacity to absorb knowledge? Is the balance of technological payments sufficient to realistically illustrate the current situation? What tangible exchanges should be measured? Are statistics on the various forms of scientific collaboration useful to this end? What other indicators can be developed for Uganda?

2.5.7 Diffusion and use of technologies

Economic growth increasingly depends on the continuous supply and use of technologies. However, a large gap exists between developed and developing countries regarding the diffusion and use of certain technologies i.e. information and communication technologies (ICTs). How can diffusion and use of new technologies be measured? What are the underlying concepts and mechanisms for collecting data and producing indicators on access to and transfer and utilization of technologies?

2.5.8 Impact of science on development

Governments fund R&D programmes for their potential contribution towards social and economic development. Apart from the S&T economic impact indicators such as the balance of technological payment, dissemination of information and communications technologies, there are generally few impact indicators,. Would it be desirable to define other impact indicators? How can social impacts, organisational impacts, etc. of science and technology be measured?

2.6 Challenges

The mandate to promote and coordinate the development and application of Science, Technology and Innovation (STI) is affected by the inability to influence budgetary allocations. As a result, the Council has very limited influence on S&T institutions which affects compilation of data and consequently the development of statistics and indicators.

The STI policy for Uganda demands institutions to regularly collect S&T data and develop institutional databases and inventories which feed into the national S&T database and directory. However institutions do not regularly compile data. The data collected varies across institutions depending on their sector or need. Data collected by S&T institutions and the Council is not often analyzed to provide meaningful indicators due to inadequate capacity.

Most institutions lack experience and basic training on the development of S&T statistics and indicators. This is exacerbated by the unavailability of appropriate manuals on methodology and standards. Most institutions including Council use software that is not applicable to statistical processes. The Council has been using CDS/ISIS, a package developed and supplied by UNESCO.

There exists S&T data from education, agriculture and natural resources. However, some of the most useful S&T statistics are not available or are difficult to obtain. For example, the amount, distribution and utilization of funds allocated to S&T activities is difficult to analyze due to conventional government budgeting procedures which do not permit explicit and clear identification of funding allocations to S&T activities.

The current budget is inadequate to provide support to S&T activities. Statistical activities are either delayed or not implemented because what is available may not be accessible in time. The budget for conducting nation-wide S&T/R&D surveys is also non-existent. In addition, training and capacity building in data collection, and dissemination of S&T data are seldom carried out due to lack of funds.

Human resource and infrastructural capacity to handle data in the S&T sector is inadequate.

Most of the present S&T data generated by the S&T stakeholder agencies is mainly based on incomplete administrative records that are not harmonized.

Poor co-ordination among data producers and users within the national S&T system has resulted into duplication and silos of information in some S&T-related sectors.

Low appreciation of the importance and role of the S&T sector by the public, policy makers and funding agencies.

2.7 SWOT Analysis of the S&T Plan for Statistics

The Government of Uganda considers S&T as a strategic sector in guiding the national development process. This is clearly articulated in Vision 2025 document, which highlights Uganda's vision for attaining a scientific and technologically advanced society by the year 2025 and the National Development Plan (NDP). This notwithstanding, the S&T sector is still characterized by a number of factors highlighted in the SWOT analysis of the S&T Statistics Plan:

2.7.1 Strengths

- The existence of a functional Statistics Unit within the Division of S&T Policy and Coordination manned by S&T professionals in the UNCST organisational structure.
- *Good S&T information acquisition infrastructure*: UNCST has a good institutional infrastructure for S&T data collection. This is a network of institutions collecting information on each and every conceivable socially and scientifically relevant S&T subject.
- *Growing demand for S&T statistics*: The first system of scientific and technological information in Uganda appeared in the late 1980s. By the late nineties, the demand and the market for S&T-related software, data and services increased.
- Well established contacts and good networks with other stakeholder institutions within the national S&T system and international institutions. Stakeholders of the S&T system are known and recognize the various synergies across the different users and producers of S&T statistics.
- UNCST collects and compiles relevant S&T data according to methodologies recommended by UNESCO, OECD, World Bank, etc.
- Legal setting-authority to collect reliable S&T statistical and accounting information, independent status; good reputation among economic and international S&T bodies.
- Crucial outputs produced with some degree of regularity and improving quality; recognised as an important government institution in charge of science and technology, with a small core staff able to handle methodologically advanced tasks.

- Statistics are produced in accordance with scientific principles, professional ethics and internationally acceptable standards and guidelines.

2.7.2 Weaknesses

- *Data divergences and access issues*: Existing data sets have been compiled from different sources using different methodologies thus making integration of S&T data difficult.
- There is lack of joint and collaborative programmes and comprehensive plans for S&T data collection, analysis and dissemination which leads to duplication of efforts and wastage of scarce financial resources.
- There is a general lack of awareness of the value of S&T statistics and indicators by policy makers and the general public, leading to inadequate allocation of resources for S&T statistics production.
- There is a varying degree of data accuracy among and within various S&T sectors due to limited training and capacity building of staff in data collection and management.

2.7.3 Opportunities

- *The National Development Plan (NDP)*: The NDP, which is the overarching planning framework, recognizes the pivotal role and potential of S&T in poverty reduction. The NDP provides an opportunity for the integration and streamlining of S&T into a number of sector plans and investment programmes. Government emphasis on monitoring and evaluation of progress towards the NDP theme, "Growth, Employment, and Prosperity". In addition, emphasis on evidence-based policy making and results-based agenda has increased demand for S&T statistics both nationally and internationally in terms of quantity, type and quality.

- Collaboration with Uganda Bureau of Statistics (UBOS) and the evolution of the PNSD, the proposed basket funding for statistics across sectors; existence of LOGICs, EMIS, HMIS as sources of raw data for generating S&T statistics and indicators; and the proposed establishment of the Community Information System (CIS) for generation of community level and district information – micro S&T statistics.

- *Existing competencies in S&T:* Over the years, a number of institutions have developed competencies, human resource and infrastructure, in specialized areas of S&T.

- *Regional and international initiatives:* A number of regional and international initiatives provide opportunities for the advancement of S&T as a means to achieving sustainable development. To this effect, Government has shown commitment to initiatives such as the New Partnership for Africa's Development (NEPAD) and the Millennium Science Initiative (MSI).

- *Stakeholder appeals and initiatives:* In light of the growing recognition of the pivotal role of S&T in the transformation of the economy, various stakeholders particularly H.E. the President of the Republic of Uganda, development partners, and the private sector have made consistent appeal for the prioritization of S&T on the country's development agenda. This appeal has been the precursor to initiatives such as the Presidential Innovations Awards and the MSI.

2.7.4 Threats

- The harmonisation of national with international statistical approaches. There are varying reporting requirements by donors (UNESCO, World Bank, IDRC) that are not harmonized with the national reporting standards.
- There is limited awareness and appreciation by policy makers, decision makers and the general public about the critical role played by S&T statistics and indicators in national development.
- There is limited funding of the S&T statistical system due to low prioritization of science and technology, especially the production of S&T statistics. The financing of S&T statistical activities is inadequate and sometimes irregular, data collection and compilation being largely donor-driven. Besides, budget uncertainties cause regular S&T surveys to become ad-hoc.
- There is pressure on S&T statistical programs due to increased demand for S&T statistics for measuring the increasingly complex economy and society. Oftentimes, there is an issue of response rates and time lags in obtaining S&T data. In addition, budget limitations add pressure to the efficiencies of maintaining quality of statistical services.

2.8 Risk Analysis

- Limited commitment of management in the implementation of the S&T Plan for Statistics;
- Inadequate S&T Budget.
- Irregular compilation of statistics from S&T institutions.
- Inexistence of a fully functional S&T management information system.
- Staff turnover.

3.0 STRATEGIC FRAMEWORK FOR THE S&T-SSPS

3.1 Vision

"To be a coherent, reliable, efficient and demand-driven S&T statistical system."

3.2 Mission

"To produce good quality statistics for evidence based decision making, planning and management in the S&T sector.

3.3 Strategic Objectives

The strategic objectives of the plan are;

SO1: To develop a coherent, reliable, efficient and demand-driven S&T statistical system that supports management and development initiatives through effective **"Coordination and Management"**.

SO2: To strengthen **Human Resource Development and Management** capacity for collection, analysis, dissemination and utilisation of S&T statistics.

SO3: To strengthen **Statistical Development Programs** through generating and disseminating demand-driven statistics.

3.4 Core values and principles

Stakeholders in the national S&T system in Uganda shall share and are guided by the following set of values and principles:

- *A high level of integrity (professionalism, accountability and transparency) in production of S&T statistics.*
- *Excellence* (quality, standards and best practice) in the production of S&T statistics.
- *Commitment (efficiency, effectiveness and sustainability) to the production and management of S&T statistics.*

4.0 STRATEGY FOR IMPROVING S&T STATISTICS PRODUCTION

The following are detailed strategies and activities for improving the production, storage and dissemination of science and technology statistics and indicators:

4.1 SO1: Coordination and Management

The issue

Weak coordination of producers and users of S&T data is a challenge resulting from the lack of a proper and comprehensive system. This has led to the emergence of various uncoordinated efforts in the generation of S&T statistics.

Main strategies

The following strategies have been identified to address the above issue.

- Strengthening documentation of existing S&T data and/or information.
- Advocating for S&T statistics within the S&T stakeholder community.
- Providing financial and infrastructural support to stakeholder S&T statistical units to improve quality in the generation, analysis, dissemination of S&T statistics
- Establishing and strengthening collaborative linkages with producers and users of S&T-related statistics.
- Streamlining and strengthening the institutional framework for statistical production in UNCST.
- Ensuring that the UNCST Statistical Unit is adequately equipped with physical infrastructure to coordinate the national S&T statistical system

Specific actions

In order to fulfill the above strategies, the following specific actions will be undertaken:

- Re-organize and strengthen the S&T Statistics Function at the UNCST Secretariat.
- Establish and operationalise institutional structures to support the development and utilisation of S&T statistics namely; the national S&T steering committee, the Inter Agency sub-committees on S&T statistics and the S&T Statistics Committee.
- Streamline internal management and coordination of S&T statistics.

- Create a web page for S&T statistics.
- Develop and operationalise policy guidelines and standards for statistical production and management.
- Integrate the S&T SSPS within UNCST planning and budget framework.
- Lobby for an increase in resources allocated towards the development of S&T statistics.
- Align S&T data production processes to government planning and development processes
- Develop an M&E framework for S&T statistical development.
- Review, develop or strengthen statistical capacity in terms of physical & IT infrastructure .
- Conduct advocacy campaigns within S&T institutions and among concerned oversight agencies for the provision or rational allocation of resources to S&T statistical activities.
- Conduct consultative meetings with stakeholders to establish data gaps and unmet statistics user needs.

4.2 SO2: Human Resource Development and Management

The Issue

There is limited statistical capacity to produce quality S&T statistics and indicators. There is therefore an urgent need for well trained, motivated and equipped staff.

Main strategies

In order to address the existing challenges, the following strategies will be pursued:

- Providing technical support to stakeholder S&T statistical units to improve quality in the generation, analysis, dissemination of S&T statistics.
- Strengthening the UNCST staff and stakeholder capacity for S&T statistics production.

Specific actions

In order to achieve the above strategies, the following specific actions will be undertaken:

- Train UNCST staff and stakeholders in the generation, analysis and dissemination of S&T statistics and indicators.

- Participate in study tours, attachments and conferences to build capacity and experience for S&T staff in the generation of UNCST statistics

4.3 SO3: Statistical Development Programs

The Issue

A comprehensive and holistic statistical development programme is needed to produce accurate, comprehensive, consistent and timely S&T statistics. Information in the S&T sector is generated from administrative records, M&E activities and S&T surveys.

Main strategies

The following strategies will be pursued to improve the quality of S&T statistics produced;

- Developing and implementing a comprehensive framework for the production of S&T statistics and indicators.
- Harmonizing the production processes of S&T statistics to ensure coherence and comparability within the sector.
- Generating and disseminating S&T statistics and indicators.
- Designing an S&T sector database
- Supporting the development of administrative data as a reliable source.

Specific actions

In order to fulfill the strategies in 4.3 above, the following specific activities will be undertaken:

- Assess the S&T data management processes.
- Review and standardize mechanisms and tools for collection, processing and dissemination of S&T data.
- Produce (collect and process) routine S&T statistics.
- Conduct S&T/R&D surveys and studies.
- Develop and/or update the S&T Data Bank.
- Disseminate S&T statistics.

5.0 IMPLEMENTATION PLAN

5.1 Mechanisms

Implementation will be phased over a five-year period. The priorities for the implementation of this plan during the first and subsequent years will be based on the need for strengthening the state of statistical production and usage. The priorities will be guided by the principle of sustainability, putting into consideration basic strategies of statistical advocacy, organizational and institutional development, physical and statistical infrastructure, human resource Development, data development, data dissemination and monitoring and evaluation. Furthermore, the established Sector Statistics Committee in collaboration with the policy and planning department will serve as the steering committee for the implementation of this Plan. Detailed activities are highlighted in the logical framework and activity schedule.

5.2 Monitoring and Evaluation

Monitoring and evaluation will be conducted regularly to track progress during S&T SSPS implementation and to ensure that the resources allocated are converted into outputs which can translate into long-term impacts in the sector. The logical framework (Annex B) provides the results matrix for performance monitoring.

In addition, specific studies will be undertaken to assess/evaluate statistical development as well as the overall sector performance. Information generated from the M&E activities will be used for both accountability and learning. The approaches and methodologies applied will facilitate technical and financial performance audits of the S&T-SSPS. Stakeholder participation will be sought at different levels of the M&E process to ensure ownership and utilization of the results.

Annual performance reports will be produced and widely shared with stakeholders. Reporting progress will be done through various mechanisms at four levels during;

- unit quarterly meetings,
- the annual S&T conference and consultative meetings of the annual science week,
- PNSD Inter-Agency Committee meetings, and
- M&E technical committee and Secretariat meetings.

5.3 Financing Plan

The Science and Technology Sector Strategic Plan for Statistics (SSPS) will be financed by Government and contributions from development agencies over the next five years. However, it is expected that the donor contribution will progressively go down with time as government contributions increase.

ANNEX A: STATISTICAL PRODUCTION SCHEDULE

			Level of disaggregation			
Statistics produced (Current)	**Indicators**	**Design**	**Administrative**	**Gender**	**Frequency of production**	**Publication/ Report**
Input (financial and human resources) S&T statistics						
1) Financial resources: S&T and R&D performance	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Business Enterprise R&D expenditure (BERD)	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Government R&D expenditure (GOVERD)	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Higher Education R&D expenditure (HERD)	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Expenditure on S&T services	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Expenditures on S&T education and training	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Total S&T expenditures	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Public expenditure on S&T education as % of GDP	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)

			Level of disaggregation			
Statistics produced (Current)	**Indicators**	**Design**	**Administrative**	**Gender**	**Frequency of production**	**Publication/ Report**
• Public expenditure on S&T education as % of government expenditure	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• R&D expenditures as % of GDP	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Percentage change in R&D spending	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Number of R&D institutions	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Number of FTE Researchers	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
2. Human resources: Human resources in Science and Technology (HRST): including the following related measurements	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• The percentage of public spending on S&T education in relation to GDP	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• No. of S&T graduates	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• The human capital engaged in science and R&D including the	Pre-conditioned	Administrative records, surveys	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure

			Level of disaggregation			
Statistics produced (Current)	**Indicators**	**Design**	**Administrative**	**Gender**	**Frequency of production**	**Publication/ Report**
number of scientists and engineers employed in R&D		and censuses				Report)
• Scientists and engineers in R&D (per million population)	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Gross enrolment ratio (%) at tertiary education	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
• Share of tertiary students in science, math and engineering	Pre-conditioned	Administrative records, surveys and censuses	National	Yes	Annually	S&T Status Report (Annual R&D Expenditure Report)
Human skills						
• Mean years of schooling (age 15 and above)	Pre-conditioned	Administrative records	National	Yes	Annually	Annual S&T Status/Indicators reports
• Gross enrolment ratio at tertiary level in science, mathematics and engineering (percentage)	Pre-conditioned	Administrative records	National	Yes	Annually	Annual S&T Status/Indicators reports

ANNEX B: LOGICAL FRAMEWORK

Hierarchy of Objectives	Indicators	Means of Verification	Assumptions
Overall Objective			
To be a coherent, reliable, efficient and demand-driven statistical system in the STI sector.	• World Bank statistical capacity indicator score improved from 73% in 2006 to 85% by 2012. • All statistics produced according to internationally recognized standards and in compliance with GDDS standards by 2012.	• World Bank Reports • IMF,UN Reports, WTO reports	
Purpose			
To produce high quality statistics for evidence based decision making, planning and management in the STI sector.	• % increase in sectoral and national STI policies reviewed as a result of informed decisions aided by S&T statistics by 2012. • S&T priority research agenda identified and implemented by 2011/12 • % increase in S&T basket fund allocated for national development as a result of evidence based planning by 2012 • % reduction in delays in decision-making, implementation and delivery of results by 2012 • % increase in resource allocation to the national S&T statistical system by 2012 • % increase in utilization of S&T statistics in the monitoring and evaluation of the NDP and related sectoral strategies from 2009/2010 • S&T priority research agenda identified and implemented by 2011/12 • 20% increase in user satisfaction in S&T statistics from 2007/08-2011/2012.	• Sector review reports • Ministerial Policy Statements • Budget Framework Paper • Estimates of Revenue & Expenditure • Evaluation reports for statistical development • User satisfaction survey reports • Research papers published	• MDAs adhere to the agreed standards and guidelines for S&T data production • S&T statistical development prioritised in the National Budget • S&T Statistics produced are easily accessed and utilised • Political and economic stability • Statistics users appreciate its importance

Hierarchy of Objectives	Indicators	Means of Verification	Assumptions
Results/Outputs **O.P1:** A coherent, reliable, efficient and coordinated S&T statistical system established and functional	**1.1** The existing S&T Statistics Function re-organized, strengthened and fully operational by 2009/10 **1.2** The S&T Sector Statistics Committee established and functional by 2008/09 **1.3** The national S&T Steering Committee for statistics set up by 2010/11 **1.4** S&T Sector Strategic Plan for Statistics developed and operational by 2008/09 **1.5** Internal management and coordination of S&T statistics streamlined by the end of 2011/12 **1.6** Stakeholder collaborative linkages established and strengthened by 2011/12. **1.7** S&T statistics web page developed, functional and linked to the NSS website by 2009/10. **1.8** Policy guidelines and standards for statistical production and management developed and operational by 2009/10 **1.9** S&T SSPS integrated & supported in UNCST planning & budget framework by 2009/10 **1.10** Resource mobilisation and allocation to development of S&T statistics increased by 2010/11 **1.11** S&T data production processes aligned to government planning and development processes by 2010/11 **1.12** M&E framework for S&T statistical development established by 2010/11 **1.13** UNCST statistical systems and infrastructure assessed by 2010/11. **1.14** IT infrastructure developed and strengthened by 2009/10. **1.15** Institutional framework statistical production streamlined and strengthened by 2010/11. **1.16** Producers and users of S&T statistics sensitised annually on procedures for data production, dissemination and utilisation.	• S&T Statistics Unit • Minutes of S&T statistics Committee • S&T Statistics Committee appointment reports • S&T Sector Strategic Plan for Statistics • M&E reports • Minutes of management meetings • Reports/minutes of consultative meetings • S&T statistics webpage • Policy guidelines • S&T Metadata dictionary • Budget Framework Paper • Sector budgets and releases • Financial reports • S&T statistics calendar • Assessment reports • Physical infrastructure/Assets register • Data production and dissemination guidelines • Metadata Manual • Activity reports	• Management committed to the implementation of the S&T SSPS • Adequate resources available for the implementation of the SSPS • Technical capacity available to implement the S&T SSPS • Internal and external cooperation in S&T statistical development

Hierarchy of Objectives	Indicators	Means of Verification	Assumptions
O.P2: Capacity for collection, analysis, dissemination and utilisation of S&T statistics and indicators strengthened.	**2.1** Capacity to collect, analyse, and disseminate S&T statistics built and strengthened by 2011/12. **2.2** Capacity of S&T agencies and stakeholders to collect, analyse, and disseminate statistics strengthened. **2.3** WB statistical capacity indicator score improved from 73% in 2006 to 85% by 2012. **2.4** All statistics produced according to internationally recognized standards and in compliance with GDDS standards by 2012	• Capacity building reports • M&E reports • Activity reports • M&E reports	
O.P3: Demand-driven S&T statistics produced and disseminated.	**3.1** S&T data management processes assessed by 2009/10. **3.2** Mechanism and tools for data production and dissemination reviewed and standardized by 2011/12. **3.3** Quality and timely S&T statistics produced. **3.4** S&T/R&D surveys and policy studies conducted according to national/institutional timelines. **3.5** S&T Data Bank developed and/or updated regularly. **3.6** S&T statistics disseminated in line with the NSS dissemination calendar.	• Assessment reports • Review reports • Guidelines • Statistical publications • S&T Data Bank • M&E reports • Survey/study reports • S&T Data Bank • Dissemination reports	

Hierarchy of Objectives	Input	Budget	Assumptions
Activities			
Coordination and Management 1.1 Re-organize and strengthen the S&T Statistics Function at the UNCST Secretariat. 1.2 Set up and operationalise the S&T Statistics Committee. 1.3 Set up the national S&T steering committee for statistics to advocate, oversee, monitor and evaluate the statistical development and utilization process. 1.4 Design the S&T Sector Strategic Plan for Statistics. 1.5 Streamline internal management and coordination of S&T statistics. 1.6 Conduct consultative meetings with stakeholders to establish data gaps and unmet statistics user needs. 1.7 Create a web page for S&T statistics. 1.8 Develop and operationalise policy guidelines and standards for statistical production and management. 1.9 Integrate the S&T SSPS within UNCST planning and budget framework. 1.10 Lobby for an increase in resources allocated towards the development of S&T statistics. 1.11 Align S&T data production processes to government planning and development processes 1.12 Develop an M&E framework for S&T statistical development 1.13 Review, develop or strengthen statistical capacity in terms of physical & IT infrastructure.	• Equipment • Technical expertise • Office space • Stationery • M&E tools • Consumables • Furniture & fixtures • Meeting & meeting venues • Communication costs • Travel costs • Hospitality costs	**522,000,000 UGX**	▪ Timely release of funds ▪ Competent personnel ▪ Available and reliable equipment ▪ Conducive working environment ▪ Minimal bureaucratic arrangements

Hierarchy of Objectives	Input	Budget	Assumptions
Human Resource Development and Management **2.1** Train UNCST staff and stakeholders in the generation, analysis, dissemination and utilization of S&T statistics and indicators. **2.2** Participate in study tours, attachments and conferences to build capacity and experience for S&T staff in the generation of S&T statistics.	• Training manuals & materials • Equipment & consumables • Technical expertise • Consultancy services • Stationery • Personnel • Meeting & meeting venues • Communication costs • Travel costs • Hospitality costs • Software	**1,092,500,000 UGX**	▪ Availability of financial resources ▪ Top management support ▪ Stakeholder cooperation and support ▪ Specified equipment is available

Hierarchy of Objectives	Input	Budget	Assumptions
Statistical Development Programs **3.1** Assess the S&T data management processes **3.2** Review and standardize mechanisms and tools for collection, processing and dissemination of S&T data. **3.3** Produce (collect and process) routine S&T statistics. **3.4** Conduct S&T/R&D surveys and studies. **3.5** Develop and/or update the S&T Data Bank. **3.6** Disseminate S&T statistics.	• Data collection tools • Manuals & materials • Equipment & consumables • Technical expertise • Consultancy services • Stationery • Personnel • Meeting & meeting venues • Communication costs • Travel costs • Hospitality costs • Software	**1,307,900,000 UGX**	• Potential & effective partnerships with adequate capacity for generation and use of S&T-related statistics exist ▪ Political goodwill exists ▪ Stakeholder cooperation and support ▪ Administrative data is available ▪ Financial resources are mobilized and made available

Preconditions:

1. Timely and sufficient financial, human and physical resources to support the S&T statistical system are available from government and development partners.
2. Strategic partners, with adequate capacity and skills for collecting and using S&T statistics exist.

Note:
O-Out put; P-Purpose; R-Result For Example O.P1 stands for "**Output for Purpose 1".**

ANNEX C: ACTIVITY SCHEDULE (2007/08-2011/12)

	Activity	Year 1				Year 2				Year 3				Year 4				Year 5			
1.	**COORDINATION AND MANAGEMENT**																				
1.1	Re-organize and strengthen the S&T Statistics Function at the UNCST Secretariat.																				
1.2	Set up and operationalise the S&T Statistics Committee.																				
1.3	Set up the national S&T steering committee for statistics to advocate, oversee, monitor and evaluate the statistical development and utilisation process.																				
1.4	Implement the S&T Sector Strategic Plan for Statistics.																				
1.5	Streamline internal management and coordination of S&T statistics.																				
1.6	Conduct consultative meetings with stakeholders to establish data gaps and unmet statistics user needs.																				
1.7	Create a web page for S&T statistics.																				
1.8	Develop and operationalize policy guidelines and standards for statistical production and management																				
1.9	Integrate the S&T SSPS within UNCST planning and budget framework																				
1.10	Lobby for an increase in resources allocated towards the development of S&T statistics																				
1.11	Align S&T data production processes to government planning and development processes																				
1.12	Develop an M&E framework for S&T statistical development																				
1.13	Review, develop or strengthen statistical capacity in terms of physical & IT infrastructure																				

2.	**HUMAN RESOURCE DEVELOPMENT AND MANAGEMENT**																			
2.1	Train UNCST staff and stakeholders in the generation, analysis, dissemination and utilization of S&T statistics and indicators.																			
2.2	Participate in study tours, attachments and conferences to build capacity and experience for S&T staff in the generation of S&T statistics																			
3.	**STATISTICAL DEVELOPMENT PROGRAMS**																			
3.1	Assess the S&T data management processes																			
3.2	Review and standardize mechanisms and tools for collection, processing and dissemination of S&T data.																			
3.3	Produce (collect and process) routine S&T statistics.																			
3.4	Conduct S&T/R&D surveys and studies.																			
3.5	Develop and/or update S&T Databank																			
3.6	Disseminate S&T statistics.																			

ANNEX D: BUDGET ESTIMATES (2007/08-2011/12, Ushs. '000s)

	Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1.	**Coordination and management**						
1.1	Re-organize and strengthen the S&T Statistics Function at the UNCST Secretariat.	-	200,000	50,000	25,000	-	275,000
1.2	Set up and operationalise the S&T Statistics Committee.	2,000	2,000	-	-	-	4,000
1.3	Set up the national S&T steering committee for statistics to advocate, oversee, monitor and evaluate the statistical development and utilisation process.	-	-	5,000	5,000	-	10,000
1.4	Implement the S&T Sector Strategic Plan for Statistics.	10,000	10,000	-	-	-	20,000
1.5	Streamline internal management and coordination of S&T statistics.	5,000	5,000	5,000	5,000	5,000	25,000
1.6	Conduct consultative meetings with stakeholders to establish data gaps and unmet statistics user needs.	5,000	15,000	15,000	10,000	5,000	50,000
1.7	Create a web page for S&T statistics.	-	2,000	1,000	-	-	3,000
1.8	Develop and operationalize policy guidelines and standards for statistical production and management	-	5,000	25,000	-	-	30,000
1.9	Integrate the S&T SSPS within UNCST planning and budget framework	-	5,000	15,000	-	-	20,000
1.10	Lobby for an increase in resources allocated towards the development of S&T statistics	-	10,000	15,000	20,000	-	45,000
1.11	Align S&T data production processes to government planning and development	5,000,000	5,000	5,000	5,000	-	20,000

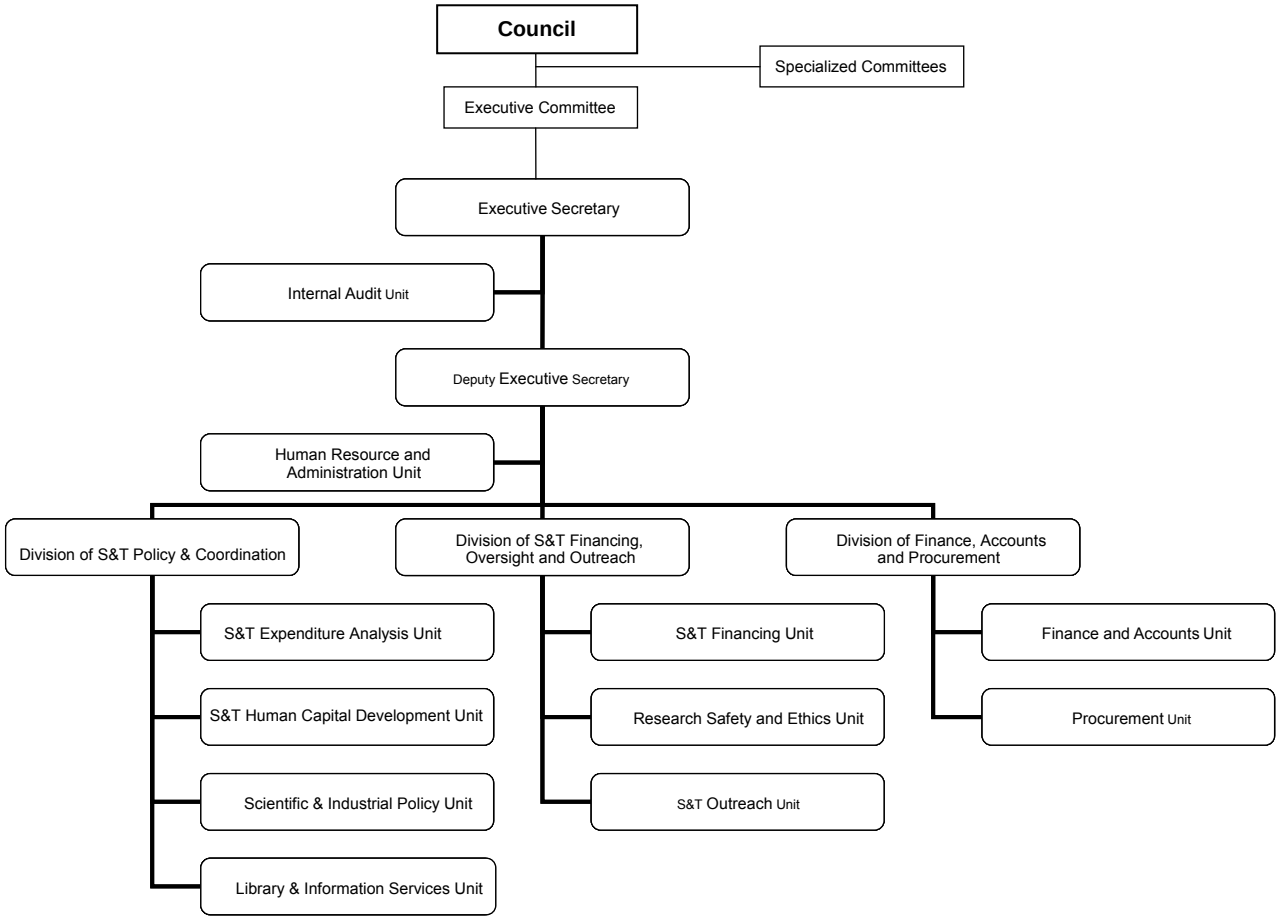
	Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	processes						
1.12	Develop an M&E framework for S&T statistical development	-	5,000	10,000	5,000	-	20,000
	Sub-total	**27,000**	**264,000**	**146,000**	**75,000**	**10,000**	**522,000**
2.	**Human Resource Development and Management**						
2.1	Train UNCST staff and stakeholders in the generation, analysis, dissemination and utilization of S&T statistics and indicators	10,000	87,500	110,000	55,000	40,000	302,500
2.2	Undertake and participate in study tours, attachments and conferences to build capacity and experience for S&T staff in the generation of S&T statistics	35,000	210,000	210,000	205,000	130,000	790,000
	Sub-total	**45,000**	**297,500**	**320,000**	**260,000**	**170,000**	**1,092,500**
3.	**Statistical Development Programs**						
3.1	Assess the S&T data management processes	10,000	10,000	10,000	-	-	30,000
3.2	Review and standardize mechanisms and tools for collection, processing and dissemination of S&T data.	-	20,000	20,000	20,000	20,000	80,000
3.3	Produce (collect and process) routine S&T statistics.	15,000	15,000	15,000	15,000	15,000	75,000
3.4	Conduct S&T/R&D surveys and studies.	151,780	97,180	97,180	97,180	97,180	540,500
3.5	Develop and/or update the S&T Data Bank.	-	100,000	100,000	50,000	50,000	300,000

	Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total
3.6	Disseminate S&T statistics.	30,000	63,100	63,100	63,100	63,100	282,400
	Sub Total	**206,780**	**305,280**	**305,280**	**245,280**	**245,280**	**1,307,900**
	Total	**278,780**	**866,780**	**771,280**	**580,280**	**425,280**	**2,922,400**
	Note: 1 USD$=2,000 (Ug. Shs)	**139.39**	**433.39**	**385.64**	**290.14**	**212.64**	**1,461.2**

ANNEX E: CHALLENGES, STRATEGIES AND PRIORITY ACTIVITIES (2007)

Challenges	Strategies	Priority Activities for the Initial year
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY (UNCST) **Implementing Dept**: S&T Policy Coordination Division **Headed by**: Assistant Executive Secretary		
▪ Difficulties in coordinating multiple producers of S&T-related data that is used for producing national S&T statistics and indicators ▪ Un met data requirements of the different international S&T organizations with varying S&T statistical frameworks or reference manuals ▪ Building a culture of S&T documentation in stakeholder institutions	• Build advocacy for S&T statistics • Strengthen documentation on existing S&T data and/or information • Ensure that human resource in the UNCST statistical unit has the requisite capacity to collect, analyze and manage S&T statistics and indicators • Ensure that the UNCST Statistical Unit has adequate physical infrastructure to coordinate the national S&T statistical system • Develop and implement a comprehensive framework for the development of S&T statistics and indicators • Generate S&T statistics and indicators and disseminate them to relevant stakeholders and the general public	• Convene a Policy dialogue on the status of S&T in Uganda (Consultation & Sensitization) • Develop meta-data for S&T statistics in Uganda • Train existing staff in best practices for S&T data management (Study tours and Placements) • Procure and maintain IT infrastructure and equipment • Develop a holistic programme for timely production of Annual S&T Statistics/Indicator report [framework and tools for data capture, and data sharing modalities) • Collect administrative data within the S&T sector (Spending on S&T, R&D, and S&T services; S&T personnel).

ANNEX F: UNCST ORGANOGRAM



□ The S&T Policy Coordination Division undertakes all the statistics functions of the Council.