UNCST

THE REPUBLIC OF UGANDA

NATIONAL SURVEY
OF RESEARCH AND DEVELOPMENT

2012 Report

UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY
Ministry of Finance, Planning and Economic Development

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Foreword

The Uganda National Council for Science and Technology (UNCST) monitors research and experimental development (R&D) activity, in the various sectors of the economy through regular surveys. Surveys are carried out on R&D activities of the business sector, the government sector, the higher education sector and the private non-profit sector.

The R&D data is used to establish the status and trends of R&D activities conducted by government ministries, departments and agencies, research institutes, institutions of higher education, industry and private non-profit organisations during a specified reference period. The National Survey of R&D is carried out once every two years and the analysis of the results provides insights into thhe developments of R&D activities undertaken in Uganda.

The 2012 R&D survey adopted the Frascati Manual guidelines issued by the Organisation for Economic Cooperation and Development (OECD) to enable international comparison. The data in this report forms the evidence base for public policy formulation, implementation and analysis. It also facilitates regional and international interventions in the field of science and technology.

The survey was well received by the respondents in all the sectors. The results have been made available to the public to support research, investment decision making and public policy. It is our sincere hope that you find this report a useful resource material for your various purposes.

We welcome feedback on any aspect of this Report to enhance its readership and usage.

Ismail N. Barugahara
Head, STI Policy and Coordination
Uganda National Council for Science and Technology

Acknowledgement

The UNCST extends its sincere gratitude to individuals and organisations that participated in the 2012 National Survey of Research and Development. Particularly acknowledged is the contribution of the various public and private organisations in the business, government, higher education and private non-profit sectors.

The financial support extended to the UNCST by the Government of Uganda and the World Bank for this Survey is greatly appreciated. Also acknowledged are the Uganda Bureau of Statistics (UBOS) and Ministry of Trade, Industry and Cooperatives (MTIC) for their contribution towards successful implementation of the Survey.

The UNCST is profoundly thankful to its staff in the STI Policy and Coordination Division for their diligence and commitment to implementing the Survey, conducting analytical work, and preparing this Survey Report. The personal dedication of Richard B. Lutalo and Patrick Mafabi in executing the most excruciating tasks in the Survey is highly appreciated. The commitment of the principal investigators Bashir R. Kagere, Catherine Munabi Tukacungurwa and Sulaiman Ssebbale; and senior researchers Dickson Avutia, Immaculate N. Muyingo, and Noeline K. Basiime is also acknowledged.

The services rendered by the UNCST administrative support staff and the enumerators who traversed the country to implement the Survey are hereby acknowledged and highly appreciated.

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List of Tables

Acronyms and Abbreviations

ASL	Above Sea Level
BE	Business Enterprise
BERD	Business Expenditure on Research and Development
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on Research and Development
GIS	Global Information System
GOV	Government
GOU	Government of Uganda
GOVERD	Government Expenditure on Research and Development
GUF	General University Fund
HC	Head Count
HE	Higher Education
HERD	Higher Education Expenditure on Research and Development
ICT	Information and Communication Technology
ISCED	International Standard Classification of Education
MDAs	Ministries, Departments and Agencies
MDGs	Millennium Development Goals
MFPED	Ministry of Finance, Planning and Economic Development
MSI	Millennium Science Initiative
MTIC	Ministry of Trade, Industry and Cooperatives
NARO	National Agricultural Research Organisation
NCHE	National Council for Higher Education
NGO	Non-Governmental Organisation
NSE	Natural Sciences and Engineering
OECD	Organisation for Economic Cooperation and Development
PNP	Private Non-Profit
PNPERD	Private Non-Profit Expenditure on Research and Development
R&D	Research and Experimental Development

S&T	Science and Technology
SSH	Social Sciences and Humanities
STI	Science, Technology and Innovation
UBOS	Uganda Bureau of Statistics
UNCST	Uganda National Council for Science and Technology
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UShs.	Uganda Shillings

Executive Summary

The 2012 R&D Survey measures inputs in R&D in four sectors – business enterprise, government, higher education, and private non-profit – as defined in the Frascati Manual[1]. The survey relied on census and appropriate sampling techniques, and data was collected using standardised questionnaires

Key R&D Indicators

Results of the 2012 R&D Survey indicate that Uganda's Gross Domestic Expenditure on R&D (GERD) as percentage of GDP is 0.5 percent. Table S-1 shows a summary of key results.

Table S-1: Key R&D Indicators, 2010

Indicator	Value, 2010
Gross Domestic Expenditure on R&D (GERD) (Ushs. million)	194,769.3
GERD as a percentage of GDP	0.50
Total R&D personnel (HC)	4270
Total researchers (HC)	2823
Total technicians (HC)	922
Total support staff (HC)	525
Total R&D personnel (FTE)[a]	2006.9
Total researchers (FTE)[b]	1262.7
Total technicians (FTE)	447.9
Total support staff (FTE)	296.0
Total R&D personnel per 1000 total employment (FTE)	0.06
Total researchers per 1000 total employment (FTE)	0.04
Female researchers as a percentage of total researchers (HC)	24.3
Female researchers as a percentage of total researchers (FTE)	26.3

[a] *FTE = Full-time equivalent.*

[b] *Following OECD practice, doctoral students and post-doctoral fellows are included as researchers.*

The government sector spent Ushs. 75.1 billion on in-house R&D activities in 2010. This accounted for 38.6% of the GERD, making it the largest contributor to R&D expenditure. The Private Non-Profit sector had the least expenditure on R&D (1.2%) in the reference period (Table S-2).

[1] OECD (2002), Frascati Manual: Proposed Standard Practice for Surveys on Research and Development, Paris: OECD.

Table S-2: In-house R&D Expenditure by Sector, 2010

Sector	Ushs. million	Percent
Business enterprise	67,722.0	34.8
Government	75,138.9	38.6
Higher education	49,482.0	25.4
Private non-profit	2,426.4	1.2
Grand total	**194,769.3**	**100.0**

Business R&D Indicators

Table S-3 indicates that BERD as a percentage of GDP in 2010 was 0.17%, the greatest percentage being financed from foreign sources (48.9%). The total business sector HC R&D personnel and FTE R&D personnel were 2333 and 1431 respectively.

Table S-3: Business Sector Indicators, 2010

Indicators	Value
BERD (Ushs. million)	67,722.0
BERD as % of GDP	0.17
BERD financed by business enterprise (%)	37.9
BERD financed by government (%)	0.3
BERD financed by higher education (%)	0.6
BERD financed by private non-profit (%)	12.3
BERD financed from abroad (%)	48.9
Total business sector R&D personnel (HC)	2333
Total business sector researchers (HC)	1431
Total business sector R&D personnel (FTE)	1055.6
Total business sector researchers (FTE)	639

Government R&D Indicators

The results of the R&D Survey indicate that, in 2010 the government expenditure on research and development (GOVERD) expressed as a percentage of GDP, stood at 0.19% with 66.1% and 31.4% of this expenditure being financed by sources from abroad and government respectively. The total government sector headcount (HC) and full-time equivalent (FTE) R&D personnel were 744 and 545.9 respectively (Table S-4).

Table S-4: Government Sector Indicators, 2010

Indicators	Value
GOVERD (Ushs. million)	75,138.8
GOVERD as % of GDP	0.19
GOVERD financed by business enterprise (%)	0.0
GOVERD financed by government (%)	31.4
GOVERD financed by higher education (%)	1.4
GOVERD financed by private non-profit (%)	1.0
GOVERD financed from abroad (%)	66.1
Total Government sector R&D personnel (HC)	744
Total Government sector researchers (HC)	404
Total Government sector R&D personnel (FTE)	545.9
Total Government sector researchers (FTE)	264.6

Higher Education R&D Indicators

Table S-5 provides a snapshot of key indicators within the higher education sector. Survey results indicate that HERD as a percentage of GDP was 0.13% in 2010 mainly financed from foreign sources. The total higher education sector R&D personnel (excluding postgraduate students) in terms of HC and FTE stood at 1027 and 358 respectively.

Table S-5: Higher Education Sector Indicators, 2010

Indicators	Value
HERD (Ushs. million)	49,482.0
HERD as % of GDP	0.13
HERD financed by business enterprise (%)	2.0
HERD financed by government (%)	10.0
HERD financed by higher education (%)	28.0
HERD financed by private non-profit (%)	2.0
HERD financed from abroad (%)	56.0
Total HE sector R&D personnel (HC)	1,027
Total HE sector researchers* (HC)	880
Total HE sector R&D personnel (FTE)	358
Total HE sector researchers (FTE)	325
Total Postgraduate students(HC: PhD and Post doc)	474
Total Postgraduate students (FTE: PhD and Post doc)	39

**Excluding postgraduate students*

Private Non-Profit R&D Indicators

Private Non-Profit (PNP) expenditure on R&D as a percentage of GDP was 0.01% in 2010. As indicated in table S-6, the 2012 survey results reveal that PNP R&D personnel (FTE) and researchers (FTE) stood at 47.4 and 34.4 respectively.

Table S-6: Private Non-profit Sector Indicators, 2010

Indicators	Value
PNPERD (Ushs. million)	2426.4
PNPERD as % of GDP	0.01
PNPERD financed by business enterprise (%)	6.5
PNPERD financed by government (%)	0.5
PNPERD financed by higher education (%)	4.5
PNPERD financed by private non-profit (%)	54.3
PNPERD financed from abroad (%)	34.2
Total private non-profit sector R&D personnel (HC)	166.0
Total private non-profit sector researchers (HC)	108.0
Total private non-profit sector R&D personnel (FTE)	47.4
Total private non-profit sector researchers (FTE)	34.4

Terms and Definitions

RESEARCH AND EXPERIMENTAL DEVELOPMENT

Research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

R&D covers three activities: basic research, applied research and experimental development:

Basic Research
Basic Research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.

Applied Research
Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental Research
Experimental Research is systematic work, drawing on knowledge gained from research and practical experience that is directed to producing new materials, products and devices; to installing new processes, systems and services; or to improving substantially those already produced or installed.

HUMAN RESOURCES IN R&D

All persons directly employed on R&D, as well as those providing direct services such as R&D managers, administrators, and clerical staff.

Researchers
Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods, systems and also in the management of the projects concerned. Postgraduate students at the PhD level engaged in R&D are considered as researchers.

Technicians and equivalent staff
Technicians and equivalent staff are persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences (technicians) or social science and humanities (equivalent staff). They participate in R&D by performing

scientific and technical tasks involving the application of concepts and operational methods, normally under the supervision of researchers.

Support Staff
Other support staff include skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects. Also included in this category are managers and administrators dealing mainly in financial and personnel matters and general administration, insofar as their activities are a direct service to R&D.

HEADCOUNT (HC)

Headcount refers to the total number of persons who are mainly or partially employed on R&D. Every person involved in R&D (regardless of qualification, gender or nationality and whether the person is a researcher, technician or support staff) is considered as a single headcount.

FULL-TIME EQUIVALENT (FTE)

FTE is the true measure of the volume of R&D or the number of persons actually involved in R&D. FTE is based on the actual proportion of time a researcher, technician or support staff spends on R&D during the reference year.

R&D EXPENDITURE

Intramural expenditures
Intramural expenditures are all expenditures for R&D performed within a statistical unit or sector of the economy during a specific period, usually a year, whatever the source of funds. This expenditure is categorized into current costs and capital expenditures.

Current Costs
Current costs are composed of the total labour costs and other current costs described as follows:

- **Labour costs of R&D personnel**

These comprise annual wages and salaries and all associated costs or fringe benefits, such as bonus payments, holiday pay, contributions to pension funds and other social security payments, payroll taxes, etc. postgraduate students who are on the payroll of universities or R&D units (e.g. research assistants) and/or receive external funds for R&D (such as research scholarships) are included as labour costs.

- **Other current costs**

These comprise non-capital purchases of materials, supplies and equipment to support R&D performed by the statistical unit in a given year. All costs for indirect services are included here, whether carried out within the organisation concerned or hired or purchased from other suppliers. Examples include services such as security, storage, use, repair and maintenance of buildings and equipment, computer services, and printing of R&D reports.

Capital Expenditures

Capital expenditures are the annual gross expenditures on fixed assets used in the R&D programmes of statistical units. These are reported in full for the period when they took place and are not registered as an element of depreciation. They include the following:

- **Land and buildings**

This comprises land acquired for R&D (e.g. testing grounds, sites for laboratories and pilot plants) and buildings constructed or purchased, including major improvements, modifications and repairs.

- **Instruments and equipment**

This covers major instruments and equipment acquired for use in the performance of R&D including embodied software.

- **Computer software**

This includes acquisition of separately identifiable computer software for use in the performance of R&D, including programme descriptions and supporting materials for both systems and applications software. Annual licensing fees for the use of acquired computer software are also included

Extramural expenditures

Extramural expenditures are the sums a unit, organisation or sector reports having paid or committed to pay to another unit, organisation or sector for the performance of R&D during a specific period. This includes acquisition of R&D performed by other units and grants given to others for performing R&D. R&D may be outsourced within the country (internal outsourcing) or outside of the country (external outsourcing). The monetary value or expenditure for outsourcing R&D is not included in the survey as part of an organisation's R&D expenditure.

Gross Expenditure on Research and Development (GERD)

GERD is the total intramural expenditure on R&D performed on a national territory during a given period, usually a year. It includes R&D performed within a country and funded from abroad but excludes payments for R&D performed abroad. GERD is constructed by adding together the intramural expenditures of the four performing sectors of business, government, higher education, and private non-profit.

RESEARCH INTENSITY

Gross Domestic Product (GDP)

The total market value of all final goods and services produced in a country within a year and used as a measurement of a country's economic performance. Thus a country's rising GDP indicates economic growth while declining GDP indicates economic decline.

Research Intensity (GERD / GDP ratio)

This is the ratio of a country's gross expenditure on R&D (GERD) to the country's GDP. Consequently, the higher the research intensity or GERD/GDP ratio of a country, the greater the national emphasis or expenditure on R&D in relation to its economy.

FIELD OF SCIENCE AND TECHNOLOGY

These are the six major fields of science and technology suggested in the UNESCO's "Recommendation Concerning the International Standardisation of Statistics on Science and Technology" (1978). These fields are:

- Natural sciences
- Engineering and technology
- Medical sciences
- Agricultural sciences
- Social sciences
- Humanities

Uganda: Key Socio-Economic Indicators, 2011/2012

Geographical Indicators	
Latitude	4°12'N & 1°29'S
Longitude	29°34'E & 35°0'E
Altitude (minimum ASL) (maximum ASL)	620 metres 5,110 metres
Total surface area	241,550.7 km^2
Area under land	199,807 km^2
Area under water and swamps	41,743 km^2
Temperature	16-31°C
Rainfall	700 - 2000 mm/year
Economic Indicators, 2011	
GDP at current market prices	45,607 billion Shs.
Per capita GDP at current market prices	1,384,566 Shs.
GDP growth rate at constant (2002) market prices	5.9 percent
Per capita GDP growth rate at constant (2002) market prices	2.2 percent
Contribution of agriculture to GDP at current market prices	22.9 percent
Balance of payments deficit	90.06 million US$
Inflation rate	18.7 percent
Budget deficit excluding grants as a percentage of GDP (2011/12)	7.2 percent
Demographic and socio-economic indicators	
Total population (2012 mid-year)*	34.1 million
Percentage urban (2012 mid-year)*	14.7 percent
Population of Kampala city (2012 mid-year)*	1.72 million
Sex ratio of total population (2002 census)	95 males per 100 females
Population density (2002 census)	123 persons /km^2
Infant Mortality rate (2002 census)*	76 per 1000 live births
Life Expectancy at birth (2002 census)* Male Female	50.4 years 48.8 years 52.0 years
Pupil Teacher ratio (Primary 2011)	49
Pupil Classroom ratio (Primary 2011)	58
Student Teacher ratio (Secondary 2011)	19
Student Classroom ratio (Secondary 2009)	35

Note: * Demographic estimates were based on the Census 2002 final results. Only population of gazetted city, municipalities and towns was considered as urban population.

Source: Uganda Bureau of Statistics 2012 Statistical Abstract

Chapter 1

Introduction

1.1 Background

The Uganda National Council for Science and Technology (UNCST) biennially conducts the National Survey of Research and Experimental Development (R&D) to measure inputs in R&D in the country. The 2012 R&D Survey was conducted in collaboration with the Uganda Bureau of Statistics (UBOS) and the Ministry of Trade Industry and Cooperatives (MTIC), with financing from the Government of Uganda and the World Bank.

The R&D surveys are a rich source of information that facilitates effective planning and policy formulation with respect to science, technology and innovation (STI) by both the public and private sectors. The surveys generate data that enable the design and implementation of interventions to address national, sectoral and local needs. The indicators provided in this report comprise the main subset of the science and technology (S&T) indicators; and data tables specified for R&D Surveys by the Organisation for Economic Co-operation and Development (OECD).

1.2 Methodology

The 2012 R&D Survey covered the business enterprise, government, higher education, and private non-profit sectors as defined in the Frascati Manual. These sectors were surveyed during the period April to June 2012, covering personnel and expenditure inputs in 2010.

The survey relied on census and appropriate sampling techniques. Data was collected using standardised questionnaires across the four (4) sectors. The questionnaires were pretested on selected expert respondents for consistency, chronology and clarity of questions. Questionnaires were then administered to respondents by a team of trained enumerators. Press releases and telephone calls were made to respondents to publicise the survey. Field supervision visits were undertaken to support the enumeration exercise.

The following methods were used to survey the four sectors:

Business sector: A representative sample of the business sector was drawn from the 2010/11 Census of Business Establishments Report prepared by UBOS. The sample covered businesses with a turnover of at least 10 million Uganda shillings and employing at least 5 persons. An imputation of the results to the target population was undertaken based on the weighted sample.

Government sector: A census approach was used to survey Government ministries, departments and agencies (MDAs) and associated R&D institutes.

Higher education sector: A census of higher education institutions was conducted covering public and private universities, teacher training colleges, colleges of commerce, and technical institutes.

Private non-profit sector: A census of all registered R&D performers was undertaken using a frame provided by the NGO Board.

On average 2-3 call backs were allowed for enumerators to collect questionnaires from respondents. Follow-up was made by telephone and physical visits to ensure full completion of questionnaires. All returned questionnaires were checked for completeness and accuracy prior to entry. The data was entered using double-entry system where the results were compared for consistency and accuracy of the entries. Cleaned and accurate data files were captured using Epidata version 3.1 and analysed using Stata version 11 computer software. Descriptive statistics were generated and presented using tabulations and graphs.

1.3 R&D Indicators

The Gross Domestic Expenditure on Research and Development (GERD) is one of the most common and most often quoted R&D indicators, showing how much a country spends on research and experimental development. The 2012 R&D Survey indicates that Uganda's GERD as percentage of GDP is 0.5 percent. Table 1.1 shows a summary of key results that combine data for the four sectors surveyed.

Table 1.1: Key R&D Indicators, 2010

Indicator	Value
Gross Domestic Expenditure on R&D (GERD) (Ushs. million)	194,769.3
GERD as a percentage of GDP	0.50
Total R&D personnel (HC)	4270
Total researchers (HC)	2823
Total technicians (HC)	922
Total support staff (HC)	525
Total R&D personnel (FTE)[a]	2006.9
Total researchers (FTE)[b]	1262.7
Total technicians (FTE)	447.9
Total support staff (FTE)	296.0
Total R&D personnel per 1000 total employment (FTE)	0.06
Total researchers per 1000 total employment (FTE)	0.04
Female researchers as a percentage of total researchers (HC)	24.3
Female researchers as a percentage of total researchers (FTE)	26.3

[a] *FTE = Full-time equivalent.*

[b] *Following OECD practice, doctoral students and post-doctoral fellows are included as researchers.*

Chapter 2

Business Sector

2.1 Introduction

The R&D survey in the business enterprise (BE) sector provides an indication of R&D performance across the business sector in the economy.

2.2 Survey Methods

The business enterprise list was drawn from the 2010/11 National Business Register prepared and maintained by the Uganda Bureau of Statistics (UBOS). The sampling frame for the Business R&D survey was restricted to businesses with a turnover of at least 10 million shillings and employing at least 5 persons[2]. The survey was conducted among enterprises identified as potential R&D performers.

2.2.1 Sample Determination and Allocation

The sample size n was determined using Optimum Allocation as follows:

$$n = \frac{\sum(N_h S_h \sqrt{C_h})\,(\sum(N_h S_h/\sqrt{C_h})}{N^2B^2+\sum(N_h S_h^2)}$$

Where N_h is the population in each stratum
S_h is the standard deviation of the employment in each stratum
C_h is the cost of administering a questionnaire in the h^{th} stratum (in United States Dollars)
N is the total population
B is E^2/k^2

In order to estimate the average number of businesses and to be 95% (k=1.96) confident that the estimate will be close to the true value, an error of not more than 3 businesses (E=3) was allowed.

The total sample size (n) was 281 businesses. Based on experience from previous surveys, a 42.5 percent non-response rate was provided for, accounting for 119 businesses which were proportionately distributed across the strata. The total sample for R&D was therefore 400 businesses. The allocation of the 400 sampled businesses to each stratum was done using Optimum Allocation and the selection of businesses was done using systematic sampling.

[2] It excluded the following sectors: health and education; public sector; agriculture, fishing & forestry; and trade, which were covered in the Government and Higher Education Surveys.

The choice of optimum allocation was based on the premise that it yields the least standard error. The distribution of the sample by stratum is as shown in Table 2.1 below.

Table 2.1: Distribution of the Sample by Strata

Industry	N_h	Sample	S_h	C_h
Mining and quarrying	66	5	38	375
Food processing	756	121	242	7,563
Other manufacturing	1464	50	71	3,125
Utilities	91	5	30	313
Construction	491	23	56	1,438
Transport and storage	613	11	23	688
Accommodation & food services	2130	23	27	1,438
Information & communication	324	17	53	1,063
Financial & insurance services	1258	37	58	2,313
Real estates & business services	1460	88	125	5,500
Recreation & personal services	584	20	44	1,250
Total	**9237**	**400**	**767**	**25,063**

Table 2.2 indicates a 76% response rate for the 2012 Business R&D Survey. R&D performing enterprises accounted for 14.8% of the responses.

Table 2.2: BE Sector Response Rates, 2010

Enterprises	Units	Percent
Sample	400	100
Response	304	76
No R&D	259	85.2
R&D performed	45	14.8

2.3 Survey Findings

2.3.1 Results

The business enterprise sector devoted Ushs. 67.7 billion to R&D activities in 2010. This accounted for 34.8% of the GERD making it the second largest contributor to R&D expenditure in the reference period (Table 2.3).

Table 2.3: In-house R&D Expenditure by Sector, 2010

Sector	Ushs. million	Percent
Business enterprise	67,722.0	34.8
Government	75,138.9	38.6
Higher education	49,482.0	25.4
Not-for profit	2,426.4	1.2
Grand total	**194,769.3**	**100.0**

Table 2.4 indicates that Business Expenditure on Research and Development (BERD) as a percentage of GDP in 2010 was 0.17%, the greatest percentage being financed from foreign sources (48.9%). The total business sector R&D personnel in terms of HC and FTE were 2333 and 1055.6 respectively.

Table 2.4: Business Sector Indicators, 2010

Indicators	Value
BERD (Ushs. million)	**67,722.0**
BERD as % of GDP	0.17
BERD financed by business enterprise (%)	37.9
BERD financed by government (%)	0.3
BERD financed by higher education (%)	0.6
BERD financed by private non-profit (%)	12.3
BERD financed from abroad (%)	48.9
Total business sector R&D personnel (HC)	2333
Total business sector researchers (HC)	1431
Total business sector R&D personnel (FTE)	1055.6
Total business sector researchers (FTE)	639

A total of 2333 R&D personnel were employed in Uganda's business sector in 2010. Of these 61.3% were employed as researchers, 24.8% as technicians, and 13.8% as other support staff. This sector was also the largest employer accounting for over 50% of the total R&D personnel (excluding doctoral and post-doctoral students) as shown in Table 2.5 below.

Table 2.5: Headcount of R&D Personnel by Sector, 2010

Sectors	Researchers	Technicians	Support Staff	Grand Total	Percent
Business	1431	579	323	2333	54.6
Government	404	206	134	744	17.4
Higher education	880	108	39	1027	24.1
Private non-profit	108	29	29	166	3.9
Grand Total	**2823**	**922**	**525**	**4270**	**100.0**
Higher education doctoral and postdoctoral students	474	-	-	474	-
Total	**3297**	**922**	**525**	**4744**	**100.0**

2.3.2 In-house R&D Expenditure

Current costs contributed over 70% of the total expenditure on R&D in the Business sector. Although funding devoted to capital expenditure was minimal, the greater proportion of this outlay was devoted to plant and machinery (12.7%) as shown in Table 2.6.

Table 2.6: BERD by Accounting Category, 2010

Type of Expenditure	Ushs. million	Percent
Labour costs	19,600.0	28.9
Other current costs	29,200.0	43.1
Total current costs	**48,800.0**	**72.1**
Land and buildings	2,050.0	3.0
Plant and machinery	8,620.0	12.7
Vehicles	3,510.0	5.2
Computers	2,160.0	3.2
Other office equipment	1,700.0	2.5
Work In progress for capital assets	879.0	1.3
Total Capital Expenditure	**18,919.0**	**27.9**
Grand Total	**67,722.0**	**100.0**

Table 2.7 indicates that research and development expenditure in the business sector was mainly concentrated in basic research (43.2%) followed by applied research (33.4%) and experimental development (23.4%).

Table 2.7: BERD by Type of Research, 2010

Type of Research	Ushs. million	Percent
Basic research	29,254.2	43.2
Applied research	22,630.1	33.4
Experimental development	15,837.7	23.4
Total	**67,722.0**	**100**

2.3.3 BERD by Source of Funds

Approximately 49% of all R&D spending in the business sector was financed by foreign funds, while about 38% of the expenditure was funded from own funds of the business enterprises (Table 2.8).

Table 2.8: BERD by Source of Funds, 2010

Source of Funds	Ushs. million	Percent
Business enterprise	25,652.0	37.9
Direct government	233.0	0.3
Higher education	397.0	0.6
Private non-profit	8,340.0	12.3
Funds from abroad	33,100.0	48.9
Total	**67,722.0**	**100.0**

2.3.4 BERD by Field of Science

Business expenditure on R&D was mainly concentrated in social sciences and humanities (57.1%) compared to natural sciences and engineering (42.9%). The largest component of BERD was spent in the field of social sciences (56.2%), followed by engineering and technology (23.9%) and natural sciences (17.2%) (see Table 2.9).

Table 2.9: BERD by Field of Science

Field of Science	Ushs. million	Percent
Natural sciences	11,614.9	17.2
Engineering and technology	16,220.8	23.9
Medical and health sciences	0.0	0.0
Agricultural sciences	1,221.6	1.8
Total NSE	**29,057.3**	**42.9**
Social sciences	38,048.9	56.2
Humanities	615.8	0.9
Total SSH	**38,664.7**	**57.1**
Total	**67,722.0**	**100.0**

2.3.5 R&D Personnel

The total headcount of R&D personnel in the business sector amounted to 2333 in 2010, while FTE amounted to 1055.6 in the same reference period – constituting 45.2% of headcount (Table 2.10). The results further indicate that female employees comprised 21.7% of the business sector R&D headcount in 2010.

Table 2.10: Business R&D Personnel Headcount and Full-Time Equivalent, 2010

Occupation	Headcount			Full-Time Equivalent	
	Male	Female	Total	FTE	FTE as % of Headcount
Researchers	1133	298.0	1431	639	44.6
Technicians	451	128.0	579	246.6	42.6
Other support staff	243	80.0	323	170	52.6
Total	**1827**	**506.0**	**2333**	**1055.6**	**45.2**

2.3.6 R&D Personnel by Qualification

Table 2.11 indicates that of the 2333 R&D personnel headcount employed by the business sector in 2010, 61.3% were researchers; 24.8% were technicians directly supporting R&D and 13.8% were other personnel supporting R&D. There were 194 qualified researchers at the second stage of tertiary education (doctorate or PhD level) in the business sector comprising approximately 14 percent of the total R&D personnel. Only 33 percent of the total PhD research personnel were female. The majority of the R&D personnel in the business sector held masters and bachelors degrees.

Table 2.11: R&D Personnel by Qualification, 2010

Qualification	Male	Female	Total
Researchers			
Second stage tertiary education - doctorate level (ISCED 6)	130	64	194
First stage tertiary education - theoretical (ISCED 5A)	813	225	1038
First stage tertiary education - practical (ISCED 5B)	-	-	-
Other qualifications (ISCED 4 and below)	190	9	199
Sub-Total	**1133**	**298**	**1431**
Technicians			
Second stage tertiary education - doctorate level (ISCED 6)	-	-	-
First stage tertiary education - theoretical (ISCED 5A)	285	128	413
First stage tertiary education - practical (ISCED 5B)	116	-	116
Other qualifications ((ISCED 4 And Below)	49	-	49
Sub-Total	**450**	**128**	**578**
Other Support Staff			
Second stage tertiary education - doctorate level (ISCED 6)	-	-	-
First stage tertiary education - theoretical (ISCED 5A)	159	45	204
First stage tertiary education - practical (ISCED 5B)	-	26	26
Other qualifications ((ISCED 4 And Below)	84	9	93
Sub-Total	**243**	**80**	**323**
Total	**1827**	**506.0**	**2333**

Furthermore, the gender gap between male and female stood at 56.6% in 2010. The data indicates that the gender gap narrows with progression along the qualification ladder (Table 2.12).

Table 2.12: Business Enterprise R&D Personnel by Qualification and Gender Gap

Qualification	Number	Female	Gender gap (%)
Post-doc, PhD, doctorate	194	64	34
Masters	533	138	48.2
Bachelors	1122	260	53.6
Higher diplomas	142	26	63.4
Ordinary diplomas, certificates	342	18	89.3
Total	**2333**	**506**	**56.6**

2.3.7 Multidisciplinary R&D and National Priority Areas

2.3.7.1 Multidisciplinary R&D

The 2012 business sector survey revealed that multidisciplinary R&D accounted for 1.3% of the BERD. The biggest proportion of expenditure pertaining to multidisciplinary research was in agriculture and private sector competitiveness. In Table 2.13 the multidisciplinary areas of poverty eradication and wealth creation accounted for about 16% of total multidisciplinary R&D spending in 2010.

Table 2.13: BERD by Multidisciplinary R&D, 2010

Areas of Multidisciplinary Research	Ushs. million	Percent
Agricultural modernisation	309.5	35.5
Private sector competitiveness, trade	298.3	34.2
Poverty eradication and wealth creation	138.8	15.9
Architecture and mining	41.2	4.7
Environment	33.2	3.8
Health and nutrition	27.5	3.2
Human rights and law	23.1	2.7
Total Multidisciplinary Expenditure	**871.5**	**1.3**
Expenditure on Other Research	**66,850.5**	**98.7**
Grand Total	**67,722.0**	**100**

2.3.7.2 BERD by Specific Areas of National Interest

Table 2.14 gives an indication of specific areas of national interest in the business enterprise sector. Results show that only 2.6% of business sector R&D spending was devoted to national development priorities. A large amount of R&D expenditures by area of national interest (64.3%) was devoted to the areas of private sector competitiveness and industrialisation.

Table 2.14: BERD by Specific Areas of National Interest, 2010

Areas of National Interest	Ushs. million	Percent
Private sector competitiveness, industrialisation	1,114.2	64.3
Employment, infrastructural development, employment, power distribution	381.9	22.0
Agricultural modernisation	191.5	11.1
Environment, Global information system (GIS)	24.3	1.4
Poverty eradication, wealth creation	13.9	0.8
Millennium development goals (MDGs)	7.7	0.4
Total BERD Devoted to National Priorities	**1,733.5**	**2.6**
Total Expenditure on Other Research areas	**65,988.5**	**97.4**
Grand Total	**67,722.0**	**100**

2.3.8 Extramural R&D

The 2012 business R&D survey revealed that the largest percentage (about 61%) of outsourced or extramural R&D was outsourced within the Ugandan territory (Table 2.15).

Table 2.15: Business Sector R&D Outsourced/Contracted Out, 2010

Outsourced R&D	UShs million	Percent
R&D outsourced inside Uganda	102.5	60.6
R&D outsourced outside Uganda	66.6	39.4
Total Outsourced	**169.1**	**100.0**

2.3.9 Collaborative R&D Partnerships and Areas

2.3.9.1 Collaborative R&D Partnerships

In 2010 most of the collaboration occurred between R&D performing business enterprises and higher education institutions, at both national and foreign collaboration fronts. This was followed by collaborations with not-for-profit organisations and foreign organisations (Table 2.16).

Table 2.16: Number of R&D Collaborative Projects, 2010

Partner	Uganda	Foreign
Higher education institutions	365	170
Science councils	-	-
Government research institutes	-	-
Affiliated companies	-	-
Other companies	-	-
Not for profit organisations	49	49
Foreign organisations	24	24
Total	**438**	**243**

2.3.9.2 Collaborative R&D Areas

Table 2.17 indicates that the key area of R&D collaboration in the business sector among the national partners was concentrated in the areas of environmental conservation, tourism and geological surveys. Collaboration among the foreign partners was highly concentrated in the area of social research.

Table 2.17: Areas of Collaborative R&D

Areas Of R&D Collaboration*	
National Partners	**Foreign Partners**
1. Environmental conservation, tourism, geological survey	1. Social research
2. Health and nutrition	2. Engineering & construction
3. Social research	3. Marketing
4. Engineering and construction	4. Agriculture
5. Agriculture	5. Health, nutrition

* *1=high intensity and 5=low intensity*

Chapter 3

Government Sector

3.1 Introduction

The Government of Uganda (GOU) undertakes R&D directly through its ministries, departments and agencies (MDAs), while at the same time providing competitive and non-competitive research grants in strategic areas of national interest.

The government (GOV) sector is surveyed through a census covering government MDAs and associated government research institutes. The survey provides an indication of R&D performance by the government sector in the country.

3.2 Survey Methods

The government list for the 2012 R&D survey was drawn from the Government Gazette (Directory of Government Ministries, Departments and Agencies). The list included all government MDAs and R&D institutes excluding the higher education sector.

The reporting units in the government sector differ across MDAs. Some agencies have directorates or departments dedicated to R&D, while others have these activities spread across different sections within the same directorates or departments. The preferred contact at national level was a Permanent Secretary for government ministries and Executive Director, Director or Head of department for departments and agencies.

The survey procedure involved multistage processes that included questionnaire design, pretesting, recruitment and training of enumerators, data collection, data analysis and report writing. Quality control checks were undertaken at every stage of the survey. Standardised questionnaires were administered through in-person interviews across all enumeration units.

In the 2012 survey, a total of 123 questionnaires were administered to respondents in the government MDAs of which 103 were returned resulting in a response rate of 83.7 percent (Table 3.1).

Table 3.1: GOV Sector Response Rates, 2010

Entities	Units	Percent
Target population	123	100
Response	103	83.7
No R&D	47	45.6
R&D performed	56	54.4

3.3 Survey Findings

The financing of science and technology and indeed R&D has steadily been rising majorly because of the recognition by the Government of Uganda of the potential of Science and Technology (S&T) to drive economic growth and foster competitiveness. This section provides results pertaining to in-house R&D expenditure and personnel in the government sector in Uganda.

3.3.1 Results

Total R&D expenditure in Government was Ushs. 75.1 billion, which accounted for 38.6% and thus the largest contributor to GERD in 2010 (Table 3.2).

Table 3.2: In-house R&D Expenditure by Sector, 2010

Sector	Ushs. million	Percent
Business enterprise	67,722.0	34.8
Government	75,138.9	38.6
Higher education	49,482.0	25.4
Not-for profit	2,426.4	1.2
Grand Total	**194,769.3**	**100.0**

The results of the 2012 R&D Survey indicate that the government expenditure on research and development (GOVERD) expressed as a percentage of GDP stood at 0.19% in 2010, with 66.1% and 31.4% of this expenditure financed with sources from abroad and government respectively. The total government sector headcount (HC) and full-time equivalent (FTE) R&D personnel were 744 and 545.9 respectively (Table 3.3).

Table 3.3: Government Sector Indicators, 2010

Indicators	Value
GOVERD (Ushs. million)	**75,138.8**
GOVERD as % of GDP	0.19
GOVERD financed by business enterprise (%)	0.0
GOVERD financed by government (%)	31.4
GOVERD financed by higher education (%)	1.4
GOVERD financed by private non-profit (%)	1.0
GOVERD financed from abroad (%)	66.1
Total Government sector R&D personnel (HC)	744
Total Government sector researchers (HC)	404
Total Government sector R&D personnel (FTE)	545.9
Total Government sector researchers (FTE)	264.6

Government employed a total of 744 R&D personnel in 2010 comprising researchers (54.3%), technicians (27.7%), and other support staff (18.0%). As shown in Table 3.4, the sector accounted for 17.4% of the total R&D personnel (excluding doctoral and post-doctoral students).

Table 3.4: Headcount of R&D Personnel by Sector, 2010

Sectors	Researchers	Technicians	Support Staff	Grand Total	Percent
Business	1431	579	323	2333	54.6
Government	404	206	134	744	17.4
Higher education	880	108	39	1027	24.1
Private non-profit	108	29	29	166	3.9
Grand Total	**2823**	**922**	**525**	**4270**	**100.0**
Higher education doctoral and postdoctoral students	474	-	-	474	-
Total	**3297**	**922**	**525**	**4744**	**100.0**

3.3.2 In-house R&D Expenditure

The bulk (71.2%) of R&D spending in the government sector was towards current costs while only 28.8% was directed to the financing of R&D infrastructure such as land, buildings, plant and machinery in the sector as indicated in Table 3.5.

Table 3.5: GOVERD by Accounting Category, 2010

Type of Expenditure	Ushs. million	Percent
Labour costs	16,526.2	22.0
Other current costs	36,940.5	49.2
Total Current Costs	**53,466.7**	**71.2**
Land and buildings	10,687.2	**14.2**
Plant and machinery	5,727.7	**7.6**
Vehicles	1,791.3	**2.4**
Computers	457.0	**0.6**
Other office equipment	559.5	**0.7**
Work in progress for capital assets	2,449.5	**3.3**
Total Capital Expenditure	**21,672.2**	**28.8**
Grand Total	**75,138.9**	**100.0**

Table 3.6 indicates that the largest proportion of R&D expenditure in the government sector was concentrated in applied research (46.4%), followed by basic research (27.9%) and experimental development (25.7%).

Table 3.6: GOVERD by Type of Research, 2010

Type of Research	Ushs. million	Percent
Basic research	20,931.5	27.9
Applied research	34,885.9	46.4
Experimental development	19,321.4	25.7
Total	**75,138.8**	**100**

3.3.3 GOVERD by Source of Funds

Two-thirds of government R&D activities were financed from foreign sources. The contribution of government towards funding its own R&D amounted to Ushs. 23.6 billion in 2010 (Table 3.7). The business enterprise funding towards government R&D was negligible during the same period.

Table 3.7: GOVERD by Source of Funds, 2010

Source of Funds	Ushs. million	Percent
Business enterprises	5.4	0.0
Direct government	23,609.9	31.4
Higher education	1,066.9	1.4
Private non profit	765.2	1.0
Funds from abroad	49,691.5	66.1
Total	**75,138.9**	**100.0**

3.3.4 GOVERD by Field of Science

Table 3.8 shows that government expenditure on R&D was mainly concentrated in the agricultural sciences and humanities accounting for 34.7% and 23.1% respectively. The natural science and engineering (NSE) sub-sector accounted for 59% of GOVERD compared to the 41% for the social sciences and humanities (SSH) sub-sector.

Table 3.8: GOVERD by Field of Science, 2010

Field of Science	Ushs. million	Percent
Natural sciences	177.2	0.2
Engineering and technology	1,286.7	1.7
Medical and health sciences	16,803.8	22.4
Agricultural sciences	26,089.8	34.7
Total NSE	**44,357.5**	**59.0**
Social sciences	13,440.2	17.9
Humanities	17,341.1	23.1
Total SSH	**30,781.3**	**41.0**
Grand Total	**75,138.9**	**100.0**

3.3.5 R&D Personnel

In 2010,w the total HC and FTE of R&D personnel in the government sector stood at 744 and 545.9 respectively (Table 3.9). The 2012 survey results indicate that female employees comprised 32.4% of the government sector R&D headcount in 2010.

Table 3.9: Government R&D Personnel Headcount and Full-Time Equivalent, 2010

Occupation	Headcount			Full-Time Equivalent	
	Male	Female	Total	FTE	FTE as % of Headcount
Researchers	284	120	404	264.6	65.5
Technicians	130	76	206	171.1	83.0
Other support staff	89	45	134	110.2	82.2
Total	**503**	**241**	**744**	**545.9**	**73.4**

3.3.6 R&D Personnel by Qualification

In the 2012 R&D survey, the government sector employed 744 R&D personnel (headcount), of whom 404 (54.3%) were researchers. Of the 404 researchers, 88 (21.7%) were at second stage tertiary education or doctorate level, and only 17% of these researchers were female. As indicated in Table 3.10, the majority of the R&D personnel in the government sector held masters or bachelors' degrees.

Table 3.10: R&D Personnel by Qualification, 2010

Qualification	Male	Female	Total
Researchers			
Second stage tertiary education - doctorate level (ISCED 6)	73	15	88
First stage tertiary education - theoretical (ISCED 5A)	190	95	285
First stage tertiary education - practical (ISCED 5B)	11	1	12
Other qualifications (ISCED 4 and below)	10	9	19
Sub-Total	**284**	**120**	**404**
Technicians			
Second stage tertiary education - doctorate level (ISCED 6)	1	1	2
First stage tertiary education - theoretical (ISCED 5A)	80	52	132
First stage tertiary education - practical (ISCED 5B)	14	7	21
Other qualifications ((ISCED 4 and below)	35	16	51
Sub-Total	**130**	**76**	**206**
Other Support Staff			
Second stage tertiary education - doctorate level (ISCED 6)	0	1	1
First stage tertiary education - theoretical (ISCED 5A)	29	21	50
First stage tertiary education - practical (ISCED 5B)	1	0	1
Other qualifications ((ISCED 4 and below)	59	23	82
Sub-Total	**89**	**45**	**134**
Total	**503**	**241**	**744**

Survey results indicate that there is a wide gender gap (62.6%) among R&D personnel with doctorate degrees in the government sector. Comparatively, there is a narrow gender gap (8.7%) among R&D personnel with a bachelors degree within the sector (Table 3.11).

Table 3.11: Government Sector R&D Personnel by Qualification and Gender Gap

Qualification	Number	Female	Gender Gap (%)
Post-doc, PhD, doctorate	91	17	62.6
Masters	259	73	43.6
Bachelors	208	95	8.7
Higher diplomas	34	8	52.9
Ordinary diplomas, certificates	152	48	36.8
Total	**744**	**241**	**35.2**

3.3.7 Multidisciplinary R&D and National Priority Areas

3.3.7.1 Multidisciplinary R&D

Multidisciplinary R&D is critical in functional research systems because it promotes synergies, capacity building and optimal utilisation of resources. Survey results indicate that only 20.7% of R&D funding in MDAs and research institutes was devoted to multidisciplinary R&D. The largest proportion of multidisciplinary R&D in the government sector was in the area of food security, agriculture and fisheries (Table 3.12).

Table 3.12: GOVERD by Multidisciplinary R&D, 2010

Multidisciplinary Area of R&D	UShs. million	Percent
1. Food security, agriculture, fisheries	7,776.5	10.3
2. Governance	3,150.0	4.2
3. Product development	2,358.9	3.1
4. Social sciences	1,223.0	1.6
5. Primary health care, HIV	1,030.9	1.4
6. Poverty eradication and wealth creation	78.4	0.1
Total Multidisciplinary Research Expenditure	**15,617.7**	**20.7**
Other Research Expenditure	**59,521.2**	**79.2**
Grand Total	**75,138.9**	**100.0**

3.3.7.2 GOVERD by Specific Areas of National Interest

Table 3.13 indicates that about 50% of government R&D expenditure was devoted to strategic areas of national interest, with the largest amount (27.8%) of the expenditures dedicated to poverty eradication.

Table 3.13: GOVERD by Specific Areas of National Interest, 2010

National Development Priorities	UShs. million	Percent
Poverty eradication	20,895.6	27.8
Agriculture modernisation	5,345.3	7.1
Industrialisation and private sector competitiveness	4,636.3	6.2
Governance	3,547.3	4.7
Millennium development goals	2,606.1	3.5
Public health	586	0.8
Environmental management	198.9	0.3
Total Expenditure on National Priorities	**37,815.5**	**50.3**
Total Expenditure on Other Research Areas	**37,323.4**	**49.7**
Grand Total	**75,138.9**	**100**

3.3.8 Extramural R&D

The 2012 R&D survey indicated that Ushs. 735 billion was outsourced by organisations in the government sector. Of these extramural R&D funds, almost 100% was expended on R&D outsourced within Uganda (Table 3.14).

Table 3.14: Government Sector R&D Outsourced/Contracted-Out, 2010

Outsourced R&D	Ushs. million	Percent
R&D outsourced inside Uganda	733,929.3	99.9
R&D outsourced outside Uganda	1,046.0	0.1
Total Outsourced	**734,975.3**	**100.0**

The survey sought to establish the amount of R&D outsourced within the government sector that was above Ushs. 100 million. Findings show that 92% of R&D expenditures in this category was outsourced to research institutes (Table 3.15).

Table 3.15: Outsourced R&D in Excess of 100 million shillings, 2010

Outsourced R&D (>100 million)	Outsourced Entity	Ushs. million
Total R&D outsourced inside Uganda	Research institutes	677,082.5
	Business enterprise	45,927.6
	Higher education sector	9,867.3
	Government	800.0
	Sub-Total	**733,677.4**
Total R&D outsourced outside Uganda	International agencies	896.0
	Sub-Total	**896.0**
Total		**734,573.4**

3.3.9 Collaborative R&D Partnerships and Areas

3.3.9.1 Collaborative R&D Partnerships

Table 3.16 shows that the biggest proportion (42.9%) of R&D collaborative projects was found within the government research institutes. In addition, the survey revealed that the number of collaborative partnerships and projects were to some extent evenly shared both within and outside Uganda (49.1% and 50.9% respectively).

Table 3.16: Number of R&D Collaborative Projects, 2010

Partner	Uganda	Foreign
Higher education institutions	71	38
Science councils	12	10
Government research institutes	115	179
Affiliated companies	69	6
Other companies	8	5
Not for profit organisations	58	57
Foreign organisations	4	54
Total Collaborative Projects	**337**	**349**

3.3.9.2 Collaborative R&D Areas

An indication of key areas of R&D collaboration in the government sector is given in Table 3.17. The key areas of collaboration among national partners in the government sector were in agriculture, fisheries, food security and biotechnology. Foreign partners highly collaborated in areas of public health and HIV.

Table 3.17: Areas of Collaborative R&D

Areas Of R&D Collaboration*	
National Partners	**Foreign Partners**
1. Agriculture, fisheries, food security, biotechnology,	1. Public health and HIV
2. Governance and human rights	2. Funding, education and training
3. Public health and HIV	3. Governance and human rights
4. Policy formulation	4. Environmental issues including water resources management and waste management
5. ICT	5. Agriculture, biotechnology

* *1=high intensity and 5=low intensity*

Chapter 4

Higher Education Sector

4.1 Introduction

The Higher Education (HE) sector in Uganda comprises all public and private universities, technical and vocational institutes, teacher training colleges, and colleges of commerce registered by the National Council for Higher Education (NCHE). These higher education institutions are responsible for three main functions; teaching, research and consultancy services. The methodology and procedures used in undertaking the 2012 higher education survey are derived from the OECD's Frascati Manual. The survey provides an indication of R&D performance by all higher education institutions in the country.

4.2 Survey Methods

The survey frame for the 2012 R&D survey in higher education was drawn from the register of higher education institutions produced and maintained by the NCHE. The list included all institutions and agencies in the higher education sector in Uganda. Table 4.1 shows a detailed breakdown of the institutions that were involved in the survey.

Table 4.1 Classification of Institutions involved in the Higher Education Survey

Institution	Status	Number
Universities	Private	29
	Public	5
Other degree awarding institutions	Public	1
	Private	1
Tertiary institutions	Private	51
Agricultural colleges	Public	5
Commercial, hotels and cooperative colleges	Public	10
Communication technology	Public	1
Medical institutions	Public	21
National teachers colleges	Public	5
Technical college, meteorological and survey institutions	Public	7
Aeronautical training schools	Public	1
Total		**137**

The reporting units in the higher education sector differ across universities and tertiary institutions. Several institutions have centres, departments, faculties, schools or colleges

dedicated to R&D, and in many cases these activities are spread across different sections within the institutions. The main contact at national level was either a Principal, Dean, Head of Department, or Director.

A total of 402 standardised questionnaires were administered through in-person interviews across all enumeration units in the higher education sector. Of these 339 were returned representing a response rate of 84.3% (Table 4.2).

Table 4.2: HE Sector Response Rates, 2010

Entities	Units	Percent
Target Population	402	100
Response	339	84.3
No R&D	206	60.8
R&D performed	133	39.2

4.3 Survey Findings

The 2012 higher education R&D survey design employed different approaches in order to obtain the relevant information. For the large and more established institutions, questionnaires were administered at departmental level, which was the standard reporting unit for the survey. In the case of the smaller institutions, one questionnaire was administered as most of the required information was usually centrally accessible. This section provides detailed results of the survey of R&D in the higher education sector in Uganda.

4.3.1 Results

Total expenditure on R&D in the higher education sector amounted to Ushs. 49.5 billion during 2010 which accounted for 25.4% of the GERD. The university sub-sector contributed the largest share (89.4%) of the expenditure in the higher education sector (Table 4.3).

Table 4.3: In-house R&D Expenditure by Sector, 2010

Sector	Ushs. million	Percent
Business enterprise	67,722.0	34.8
Government	75,138.9	38.6
Higher education	49,482.0	25.4
Universities	44,217.7	89.36
Teacher Colleges	15.0	0.03
Technical Institutes	1,964.6	3.97
Colleges of Commerce	36.8	0.07
Other Institutions	3,247.8	6.56
Not-for profit	2,426.4	1.2
Grand Total	**194,769.3**	**100.0**

Table 4.4 provides a snapshot of key indicators within the higher education sector. Survey results indicate that Higher Education Expenditure on Research and Development (HERD) as a percentage of GDP was 0.13% in 2010. This was mainly financed from foreign sources. The total higher education sector HC and FTE R&D personnel (excluding postgraduate students) stood at 1027 and 358 respectively.

Table 4.4: Higher Education Sector Indicators, 2010

Indicators	Value
HERD (Ushs. million)	**49,482.0**
HERD as % of GDP	0.13
HERD financed by business enterprise (%)	2.0
HERD financed by government (%)	10.0
HERD financed by higher education (%)	28.0
HERD financed by private non-profit (%)	2.0
HERD financed from abroad (%)	56.0
Total HE sector R&D personnel (HC)	1,027
Total HE sector researchers* (HC)	880
Total HE sector R&D personnel (FTE)	358
Total HE sector researchers (FTE)	325
Total Postgraduate students(HC: PhD and Post doc)	474
Total Postgraduate students (FTE: PhD and Post doc)	39

**Excluding postgraduate students*

As shown in Table 4.5, most of the R&D personnel (including doctoral and postdoctoral students) in the higher education sector were researchers. In addition, the higher education sector (including doctoral and postdoctoral students) accounted for 31.6% of the total R&D personnel in 2010. Of the 3297 researchers (including doctoral and postdoctoral students), 41.1% were found in the higher education sector.

Table 4.5: Headcount of R&D Personnel by Sector, 2010

Sectors	Researchers	Technicians	Support Staff	Grand Total	Percent
Business	1431	579	323	2333	54.6
Government	404	206	134	744	17.4
Higher education	880	108	39	1027	24.1
Private non-profit	108	29	29	166	3.9
Grand Total	**2823**	**922**	**525**	**4270**	**100.0**
Higher education doctoral and postdoctoral students	474	-	-	474	-
Total	**3297**	**922**	**525**	**4744**	**100.0**

4.3.2 In-house R&D Expenditure

In 2010, in-house R&D expenditure in the higher education sector amounted to Ushs. 49,482 million. The bulk (62.9%) of R&D spending in the higher education sector was towards current costs while 37.1% was directed towards capital expenditure (Table 4.6).

Table 4.6: HERD by Accounting Category, 2010

Type of Expenditure	Ushs. million	Percent
Labour costs	8,593.4	17.4
Other current costs	22,529.6	45.5
Total Current Costs	**31,123.0**	**62.9**
Land and buildings	2,213.1	4.5
Plant and machinery	3,462.6	7.0
Vehicles	762.5	1.5
Computers	1,953.6	3.9
Other office equipment	930.6	1.9
Work in progress for capital assets	9,036.6	18.3
Total Capital Expenditure	**18,359.0**	**37.1**
Grand Total	**49,482.0**	**100.0**

Survey findings indicate that 52% of expenditure on research and development in the higher education sector was expended on applied research. On the other hand, expenditure on basic research and experimental development accounted for 33% and 15% respectively (Table 4.7).

Table 4.7: HERD by Type of Research, 2010

Type of Research	Ushs. million	Percent
Basic research	16,504.5	33
Applied research	25,518.9	52
Experimental development	7,458.6	15
Total	**49,482.0**	**100**

Table 4.8 shows that most (64.6%) of the research expenditure was in public universities. Technical institutes devoted only 2.4% of their expenditure to experimental development.

Table 4.8: Research Expenditure of Institutions in the Higher Education Sector, 2010 (Ush. million)

Institutions	Basic Research	Applied Research	Experimental Development	Total
Public universities	10,965.8	14,573.7	6,417.5	31,957.0
Private universities	2,076.6	9,207	977.4	12,261.0
Teacher training colleges	0	15.0	0	15.0
Colleges of commerce	36.8	0	0	36.8
Technical Institutes	369.6	1,547.6	47.3	1,964.5
Other Institutions	3,055.5	175.5	16.8	3,247.8
Total	**16,504.5**	**25,518.9**	**7,459.0**	**49,482.1**

4.3.3 HERD by Source of Funds

Research and Development in the higher education sector derives funds from several sources. The Frascati Manual emphasizes that in most countries the main traditional source of funds is the proportion of the publically funded block-grant known as public General University Funds (GUF). This comprises own funds and the higher education vote and it accounted for 27.3% of higher education R&D funds in 2010. Funding from foreign sources constituted the largest proportion of higher education R&D funds (56.6%) during the reference period (Table 4.9).

Table 4.9: HERD by Source of Funds, 2010

Source of Funds	Ushs. million	Percent
General University Funds	**13,530.4**	**27.3**
University own funds (own generated funds)	13,010.9	26.3
Higher education vote	519.5	1.0
Higher Education	**445.9**	**0.9**
National (excl. higher education vote)	393.7	0.8
Other Higher education institutions	52.2	0.1
Government	**5,338.4**	**10.8**
Local governments	478.9	0.9
Government research institutes	160.4	0.3
Funding from other national agencies	1,198.6	2.4
Science council funding	3,500.5	7.1
Domestic Business including Industry Funds	**818.4**	**1.7**
Private Non-Profit	**1,357.9**	**2.7**
Not for profit institutions	141.0	0.3
Donations and bequests from individuals	1,216.9	2,4
Foreign Sources	**27,990.9**	**56.6**
Grand Total	**49,482.0**	**100.0**

4.3.4 HERD by Field of Science

Table 4.10 indicates that the generic field of natural sciences and engineering (NSE) constituted the largest proportion of R&D expenditure in the higher education sector (71%), with medical sciences accounting for over half of the spending within the NSE.

Table 4.10: HERD by Field of Science

Field of Science	Ushs. million	Percent
Natural sciences	5,707.9	12
Engineering and technology	6,225.6	13
Agricultural sciences	5,298.4	11
Medical sciences	17,591.1	36
Total NSE	**34,823.0**	**71.0**
Social sciences	5,600.1	11
Humanities	9,058.8	18
Total SSH	**14,658.9**	**29.0**
Grand Total	**49,482.0**	**100.0**

4.3.5 R&D Personnel

In 2010 the number of researchers, excluding doctoral and post-doctoral students, employed in the higher education sector was 880 in headcount terms, while FTE researchers stood at 325

in the same reference period (Table 4.11). Female researchers accounted for 26.7% of the total HC researchers.

Table 4.11: Higher Education R&D Personnel Headcount and Full-Time Equivalent, 2010

Occupation	Headcount			Full-Time Equivalent	
	Male	Female	Total	FTE	FTE as % of Headcount
Researchers	645	235	880	325	37
Technicians	71	37	108	24	22
Other support staff	23	16	39	9	23
Total	**739**	**288**	**1027**	**358**	**35**

4.3.6 R&D Personnel by Qualification

The ISCED provides the basis for classifying R&D personnel by formal qualification. Table 4.12 indicates that 610 personnel (59%) had First Stage Tertiary Education (Masters and Bachelors) while 353 R&D personnel (34%) were Second Stage Tertiary Education (Doctorate Level) holders.

Table 4.12: R&D Personnel by Qualification, 2010*

Qualification	Male	Female	Total
Researchers			
Second stage tertiary education - doctorate level (ISCED 6)	253	78	331
First stage tertiary education - theoretical (ISCED 5A)	375	147	522
First stage tertiary education - practical (ISCED 5B)	3	4	7
Other qualifications (ISCED 4 and below)	14	6	20
Sub-Total	**645**	**235**	**880**
Technicians			
Second stage tertiary education - doctorate level (ISCED 6)	10	7	17
First stage tertiary education - theoretical (ISCED 5A)	39	20	59
First stage tertiary education - practical (ISCED 5B)	12	6	18
Other qualifications ((ISCED 4 and below)	10	4	14
Sub-Total	**71**	**37**	**108**
Other Support Staff			
Second stage tertiary education - doctorate level (ISCED 6)	5	0	5
First stage tertiary education - theoretical (ISCED 5A)	15	14	29
First stage tertiary education - practical (ISCED 5B)	1	0	1
Other qualifications ((ISCED 4 and below)	2	2	4
Sub-Total	**23**	**16**	**39**
Grand Total	**739**	**288**	**1027**

** Excluding post-graduates*

As shown in Table 4.13, the gender gap in higher education R&D personnel was widest (51.8%) among those with postgraduate qualifications. The overall gender gap (43.9%) reveals a significant difference between male and female participation in higher education research.

Table 4.13: Higher Education R&D Personnel by Qualification and Gender Gap

Qualification	Number	Female	Gender Gap (%)
Post doc, PhD, doctorate	353	85	51.8
Masters	506	143	43.5
Bachelors	104	38	26.9
Higher diplomas	26	10	23.1
Other diplomas, certificates	38	12	36.8
Total	**1027**	**288**	**43.9**

Table 4.14 shows that postgraduate fellows (including both postdoctoral and doctoral students) spend averagely 8.2% of their time on research and development activities. Postdoctoral students spend 5.1% of their time on research, while doctoral students spend 9.5% of their time on research. In 2010, over 60% of postgraduate students were male, while 37.2% and 28.8% of postdoctoral fellows and doctoral students respectively were female.

Table 4.14: HE Postgraduate Student Headcount and FTE by Gender and Qualification, 2010

Postgraduate Students*	Headcount			Full Time Equivalent			FTE as % of Headcount
	Male	Female	TOTAL	Male	Female	TOTAL	
Post-doctoral fellows	86	51	137	5	2	7	5.1%
Doctoral students	240	97	337	19	13	32	9.5%
Total	**326**	**148**	**474**	**24**	**15**	**39**	**8.2%**

* *Excluding masters degree students*

4.3.7 Multidisciplinary R&D and National Priority Areas

4.3.7.1 Multidisciplinary R&D

"Multidisciplinary" or "Interdisciplinary" is a fluid concept in a constant state of flux especially within the higher education system. This is often the case where science and technology disciplines naturally align themselves along their inherent technical proximities. In this survey, multidisciplinary was taken to mean any research endeavor which involved more than one of the fields of science and technology.

The survey findings indicate that multidisciplinary research was mainly conducted in the field of medical and health sciences. Table 4.15 indicates that 21.4% was dedicated to the multidisciplinary areas of primary health care and community health, with just 4.4% dedicated to poverty eradication and wealth creation.

Table 4.15: HERD by Multidisciplinary Areas, 2010

Multidisciplinary Area of R&D	UShs. million	Percent
Primary health care, community health, paediatrics	10,563.8	21.35
Poverty eradication, wealth creation, social sciences	2,161.0	4.37
Tourism, theology, culture	568.4	1.15
Fisheries, agriculture, crop management	319.4	0.65
Water resources, climate change, environment	210.3	0.42
Engineering	26.5	0.05
Total Multidisciplinary Research Expenditure	**13,849.4**	**28**
Other Research Expenditure	**35,632.6**	**72**
Grand Total	**49,482.0**	**100**

4.3.7.2 HERD by Specific Areas of National Interest

The 2012 survey sought to identify expenditure to research areas of strategic national interest. The survey findings indicate that 45% of higher education R&D expenditure was devoted to these strategic areas of national interest (Table 4.16). The highest proportion of the expenditures was devoted to poverty eradication (17%) and agricultural modernisation (12%).

Table 4.16: HERD by Specific Areas of National Interest, 2010

National Development Priorities	UShs. million	Percent
Poverty eradication	8,627.7	17
Agriculture modernisation	5,901.3	12
Medical health	2,301.5	5
Energy	1,862.5	4
Millennium development goals	1,440.6	3
Social issues	1,163.7	2
Private sector competitiveness	940.1	2
Total Expenditure on National Priorities	**22,237.2**	**45**
Total Expenditure on Other Research Areas	**27,244.8**	**55**
Grand Total	**49,482.0**	**100**

4.3.8 Extramural R&D

Institutions often outsource to offset costs, mitigate risk, maximise efficiency and to streamline operations. In this survey, R&D was outsourced to entities within and outside Uganda. As shown in Table 4.17, three quarters of outsourced or extramural R&D was contracted out to offshore entities.

Table 4.17: Higher Education Sector R&D Outsourced/Contracted-Out, 2010

Outsourced R&D	UShs. million	Percent
R&D outsourced inside Uganda	1,405.5	25
R&D outsourced outside Uganda	4,111.1	75
Total	**5,516.6**	**100**

The survey also sought to establish the amount of R&D outsourced within the higher education sector that was above Ushs. 100 million. Of the total outsourced R&D, 72.2% was above the Ushs. 100 million threshold. The bulk of the outsourced R&D expenditure (65.6%) was outsourced outside Uganda (Table 4.18).

Table 4.18: Outsourced R&D in Excess of 100 million shillings, 2010

Outsourced R&D (>100 million)	Outsourced Organisation	Ushs. million
Total R&D outsourced inside Uganda	Government	1,070.0
	Higher education	200.0
	International agencies	100.0
	Sub-Total	**1,370.0**
Total R&D outsourced outside Uganda	International agencies	2,417.0
	Higher education	195.0
	Sub-Total	**2,612.0**
Total		**3,982.0**

4.3.9 Collaborative R&D Partnerships and Areas

4.3.9.1 Collaborative R&D Partnerships

In 2010 the biggest proportion (53.3%) of R&D collaborative arrangements in the HE sector occurred between and amongst higher education institutions. The survey also revealed that most (56%) of the collaborative partnerships and projects were with foreign-based organisations (Table 4.19).

Table 4.19: Number of R&D Collaborative Projects 2010

Partner	Uganda	Foreign	Total
Higher education institutions	123 (37%)	210 (63%)	333
Science councils	29 (45%)	35 (55%)	64
Government research institutes	30 (64%)	17 (36%)	47
Private sector (domestic only)	30 (86%)	5 (14%)	35
Other companies	9 (64%)	5 (36%)	14
Not-for-profit organisations	31 (61%)	20 (39%)	51
Foreign organisations	22 (27%)	59 (73%)	81
Total	**274 (44%)**	**351 (56%)**	**625**

4.3.9.1 Collaborative R&D areas

Table 4.20 highlights the key areas of R&D collaboration or cooperation in the higher education sector in 2010. R&D collaboration in the sector was mainly in capacity building and research.

Table 4.20: Areas of Collaborative R&D

Areas of R&D Collaboration*	
National Partners	**Foreign Partners**
1. Capacity building	1. Research
2. Research	2. Capacity building
3. Environment / climate change	3. Technical support
4. Technical support	4. Funding
5. Consultancy	5. Infrastructure development

* *1=high intensity and 5=low intensity*

Chapter 5

Private Non-Profit Sector

5.1 Introduction

The 2012 Private Non-Profit (PNP) R&D survey examines the research and development activities of the PNP sector in Uganda. It provides an analytical insight into the sector spending and funding for R&D including personnel dedicated to R&D activities in the sector.

5.2 Survey Methods

The target population was all non-profit organisations that are registered as R&D performers in Uganda. A register of R&D performing organisations as maintained by the Uganda NGO Board was obtained for construction of the survey frame. The register comprises all organisations that indicated either at initial registration or at renewal that they undertake R&D activities. The register is routinely updated by the NGO Board.

The reporting unit in the PNP sector was the organisation whereas the main contact was the Executive Director, Director or Manager of the R&D-performing organisation. A total of 108 questionnaires were administered through in-person interviews across all organisations in the PNP sector, and of these 98 were returned representing a response rate of 90.7% (Table 5.1).

Table 5.1: PNP Sector Response Rates, 2010

Entities	Units	Percent
Target population	108	100
Response	98	90.7
No R&D	47	48
R&D performed	51	52

5.3 Survey Findings

The private non-profit sector survey covered the non-market, private non-profit institutions that serve the general public. This section provides detailed results of the survey of R&D in the PNP sector in Uganda.

5.3.1 Results

Table 5.2 indicates that the PNP sector was the least contributor to the gross domestic expenditure on research and development posting expenditures amounting to Ushs. 2.4 billion (1.2%) in 2010.

Table 5.2: In-house R&D Expenditure by Sector, 2010

Sector	Ushs. million	Percent
Business enterprise	67,722.0	34.8
Government	75,138.9	38.6
Higher education	49,482.0	25.4
Not-for-profit	2,426.4	1.2
Grand Total	**194,769.3**	**100.0**

PNP expenditure on R&D as a percentage of GDP was 0.01% in 2010. As indicated in Table 5.3, the 2012 survey results reveal that PNP R&D personnel (FTE) and researchers (FTE) stood at 47.4 and 34.4 respectively.

Table 5.3: Private Non-profit Sector Indicators, 2010

Indicators	Value
PNPERD (Ushs. million)	**2,426.4**
PNPERD as % of GDP	0.01
PNPERD financed by business enterprise (%)	6.5
PNPERD financed by government (%)	0.5
PNPERD financed by higher education (%)	4.5
PNPERD financed by private non-profit (%)	54.3
PNPERD financed from abroad (%)	34.2
Total private non-profit sector R&D personnel (HC)	166.0
Total private non-profit sector researchers (HC)	108.0
Total private non-profit sector R&D personnel (FTE)	47.4
Total private non-profit sector researchers (FTE)	34.4

The 2012 PNP survey results show that of the 4270 HC R&D personnel (excluding postgraduate students), 3.9% were in the PNP sector (Table 5.4).

Table 5.4: Headcount of R&D Personnel by Sector, 2010

Sectors	Researchers	Technicians	Support Staff	Grand Total	Percent
Business	1431	579	323	2333	54.6
Government	404	206	134	744	17.4
Higher education	880	108	39	1027	24.1
Private non-profit	108	29	29	166	3.9
Grand Total	**2823**	**922**	**525**	**4270**	**100.0**
Higher education doctoral and postdoctoral students	474	-	-	474	-
Total	**3297**	**922**	**525**	**4744**	**100.0**

5.3.2 In-house R&D Expenditure

Current costs accounted for the largest proportion of the total PNP expenditure on R&D totalling Ushs. 1,951.1 million (80.4%), with labour costs accounting for 52.7% of the total. Capital expenditures accounted for 19.6% of the total sector expenses with no expenses incurred on land and buildings, as shown in Table 5.5.

Table 5.5: PNPERD by Accounting Category, 2010

Type of Expenditure	Ushs. million	Percent
Labour costs	1,277.5	52.7
Other current costs	673.6	27.8
Total Current Costs	**1,951.1**	**80.4**
Land and buildings	0.0	0.0
Plant and machinery	80.2	3.3
Vehicles	216.2	8.9
Computers	122.3	5.0
Other office equipment	46.7	1.9
Work in progress for capital assets	10.0	0.4
Total Capital Expenditure	**475.4**	**19.6**
Grand Total	**2,426.4**	**100.0**

Table 5.6 indicates that the largest proportion of spending in the PNP sector by 'type of research' was in basic research accounting for 38.4% of the total R&D expenditure in 2010.

Table 5.6: PNPERD by Type of Research, 2010

Type of Research	Ushs. million	Percent
Basic research	931.8	38.4
Applied research	686.7	28.3
Experimental development	808.0	33.3
Total	**2,426.4**	**100.0**

5.3.3 PNPERD by Source of Funds

The 2012 survey results indicate that R&D in the PNP sector was mainly financed by the sector itself accounting for 54.3% of funds expended on R&D in 2010. The government was the least contributor towards R&D spending in the sector accounting for 0.5% of the total (Table 5.7).

Table 5.7: PNPERD by Source of Funds, 2010

Source of Funds	Ushs. million	Percent
Business enterprise	157.0	6.5
Direct government	13.1	0.5
Higher education	109.7	4.5
Private non-profit	1,317.5	54.3
Funds from abroad	829.1	34.2
Total	**2,426.4**	**100.0**

5.3.4 PNPERD by Field of Science

Table 5.8 indicates that PNP R&D expenditure on social sciences and humanities (SSH) was 60% in 2010 with the remaining 40% being spent on natural sciences and engineering (NSE). The medical and health sciences accounted for 38.8% while the social sciences accounted for 40.3% making expenditure in the two fields the highest in their respective categories.

Table 5.8: PNPERD by Field of Science

Field of Science	UShs. million	Percent
Natural sciences	18.4	0.8
Engineering and technology	0.2	0.0
Medical and health sciences	940.5	38.8
Agricultural sciences	9.9	0.4
Total NSE	969.0	40.0
Social sciences	978.7	40.3
Humanities	478.8	19.7
Total SSH	1,457.5	60.0
Total PNPERD	**2,426.4**	**100**

5.3.5 R&D Personnel

In 2010, the PNP sector accounted for 108 researchers, 29 technicians and 29 other R&D support staff. There were 34.4 FTE researchers in the sector, spending an average of about 31.9% of their time on research. Technicians and support staff accounted for 6.2 and 6.8 FTE respectively in the same reference period (Table 5.9). Females accounted for 36.8% of the total headcount and 31.5% of researchers in the 2012 PNP R&D survey

Table 5.9: PNP R&D Personnel Headcount and Full-Time Equivalent, 2010

Occupation	Headcount			Full-Time Equivalent	
	Male	Female	Total	FTE	FTE as % of Headcount
Researchers	74.0	34.0	108.0	34.4	31.9
Technicians	16.0	13.0	29.0	6.2	21.4
Other support staff	15.0	14.0	29.0	6.8	23.4
Total	**105.0**	**61.0**	**166.0**	**47.4**	**28.6**

5.3.6 R&D Personnel by Qualification

Survey results show that the PNP sector employed only four qualified research personnel at 'second stage tertiary education' or 'doctorate' level (Table 5.10). The 'first stage tertiary education' level accounted for the highest number of researchers, 33% of whom were female.

Table 5.10: R&D Personnel by Qualification, 2010

Qualification	Male	Female	Total
Researchers			
Second stage tertiary education - doctorate level (ISCED 6)	2	1	3
First stage tertiary education - theoretical (ISCED 5A)	54	27	81
First stage tertiary education - practical (ISCED 5B)	4	1	5
Other qualifications (ISCED 4 and below)	14	5	19
Sub-Total	74	34	108
Technicians			
Second stage tertiary education - doctorate level (ISCED 6)	1	0	1
First stage tertiary education - theoretical (ISCED 5A)	8	10	18
First stage tertiary education - practical (ISCED 5B)	4	1	5
Other qualifications ((ISCED 4 and below)	3	2	5
Sub-Total	16	13	29
Other Support Staff			
Second stage tertiary education - doctorate level (ISCED 6)	0	0	0
First stage tertiary education - theoretical (ISCED 5A)	7	8	15
First stage tertiary education - practical (ISCED 5B)	3	3	6
Other qualifications ((ISCED 4 and below)	5	3	8
Sub-Total	15	14	29
Total	**105**	**61**	**166**

Table 5.11 indicates that the gender gap narrows with an upward progression from the ordinary diploma and certificate level (37.5%) to the masters' level (9.5%). The scenario is however reversed at PhD qualification level where the gender gap widened to 50%.

Table 5.11: PNP Personnel by Qualification and Gender Gap

Qualification	Male	Female	Total	Gender Gap (%)
Post-doc, PhD, doctorate	3	1	4	50
Masters	23	19	42	9.5
Bachelors	46	26	72	27. 8
Higher diplomas	11	5	16	37.5
Ordinary diplomas, certificates	22	10	32	37.5
Total	**105**	**61**	**166**	**26.5**

5.3.7 Multidisciplinary R&D and National Priority Areas

5.3.7.1 Multidisciplinary R&D

Multidisciplinary R&D spending in the PNP sector attracted 15.4% of the total sector R&D expenditure. Public health research accounted for the largest proportion (86.0%) of the sector commitment towards multidisciplinary research (Table 5.12).

Table 5.12: PNPERD by Multidisciplinary Areas, 2010

Multidisciplinary Area of R&D	UShs. million	Percent
Public health	278.1	86.0
Environment	24.4	7. 6
Governance	12.8	3.9
Policy	8	2.5
Total Multidisciplinary Research Expenditure	**323.3**	**15.4**
Total Expenditure on Other Research Areas	**2,103.2**	**84.6**
Grand Total	**2,426.5**	**100.0**

5.3.7.2 PNP Sector R&D Expenditure by Specific Areas of National Interest

The PNP sector allocated Ushs. 1.45 billion to national priority areas accounting for 59.8% of the total sector expenditure on R&D in 2010. Table 5.13 shows that the biggest proportion (65.2%) of expenditure was geared towards addressing the Millennium Development Goals (MDGs).

Table 5.13: PNPERD by Specific Areas of National Interest, 2010

R&D National Development Priorities	UShs. million	Percent
Millennium development goals	945.4	65.2
Strengthening governance, defense and security	189.1	13.0
Increasing household incomes and equity	146.6	10.1
Increasing access to quality social services	101.7	7.0
Promoting sustainable population, use of the environment and natural resources	63.1	4.4
Enhancing human capital development	5.0	0.3
Total Expenditure on National Priorities	**1,450.9**	**59.8**
Total Expenditure on Other Research Areas	**975.6**	**40.2**
Grand Total	**2,426.5**	**100**

5.3.8 Extramural R&D

The sector outsourced R&D to the tune of Ushs.796 million which in terms of intramural R&D expenditure is 32.8%. R&D outsourced inside Uganda accounted for 92.8% of the total outsourced R&D in the sector in 2010 (Table 5.14).

Table 5.14: Private Non-profit Sector R&D Outsourced/Contracted Out, 2010

Outsourced R&D	Ushs. million	Percent
R&D outsourced inside Uganda	739	92.8
R&D outsourced outside Uganda	57	7.2
Total	**796**	**100**

5.3.9 Collaborative R&D Partnerships

The 2012 PNP R&D survey indicates that the biggest proportion of collaborative partnerships was exhibited between private non-profit organisations, accounting for 53.5% of all collaborative projects (Table 5.15). In general terms, a small proportion (20%) of the collaborative projects were of foreign origin.

Table 5.15: Number of R&D Collaborative Projects, 2010

Partner	Uganda	Foreign	Total
Higher education institutions	13 (68%)	6 (32%)	19
Science councils	1 (33%)	2 (67%)	3
Government research institutes	8 (80%)	2 (20%)	10
Affiliated companies	15 (100%)	–	15
Other companies	4 (80%)	1 (20%)	5
Not for profit organisations	59 (87%)	9 (13%)	68
Foreign organisations	2 (12%)	15 (88%)	17
Total	**102 (80%)**	**25 (20%)**	**127**

APPENDICES

QUESTIONNAIRES

Appendix 1: Business R&D Survey

UNCST Clearance

U	N	C	S	T	-	2	0	1	2	-	0	3

RESEARCH & DEVELOPMENT SURVEY (R&D) 2012

BUSINESS QUESTIONNAIRE

Reference Period: 2010

The Uganda National Council for Science and Technology (UNCST) is responsible for the development and implementation of policies and strategies for integrating Science and Technology into the national development process

Please help us measure the level of Research and Development (R&D) in the Business Sector

April 2012

Research and Development Survey (R&D), 2012

A. Background

1. ***Introduction***
The Uganda National Council for Science and Technology (UNCST) is conducting a comprehensive Research & Development Survey in Uganda following the pilot survey undertaken in 2009. The survey will collect data on the status and levels of Research and Development in the Business sector for the period 2010.

2. ***What is the Legal Mandate to collect this data?***
The UNCST is empowered to collect this data by the **UNCST Statute CAP 209** of the Laws of Uganda. The information provided by your entity will be treated with strict **confidentiality** in line with the Uganda Bureau of Statistics (UBOS) Act of 1998 and will be used only in aggregated statistical format for analysis and policy formulation purposes.

The interviewers and staff involved in the R&D survey are under oath of secrecy not to disclose any entity-specific information to a third party individual/entity. The data/information collected will only be published in aggregate form.

3. ***Why do we need to collect this information?***
The information is a key input in the compilation of the Gross Domestic Expenditure on Research and Development (GERD) – the sum of R&D expenditures in the following four economic sectors: business, government, higher education, and private non-profit. The GERD measures R&D on a national scale in order to guide the formulation, implementation and review of Science, Technology and Innovation (STI) policies.

4. ***How do you benefit?***
The R&D surveys are a rich source of information that facilitates effective planning and policy formulation with respect to Science, Technology and Innovation, which benefits both the public and private sectors. The surveys generate data that enable the design and implementation of interventions that specifically address national, sectoral and local needs.

B. Guidelines

1. ***Who needs to complete this questionnaire?***
The Chief Executive Officer or a suitable representative of the targeted entity shall fill the questionnaire.

2. ***Which parts of the questionnaire do I have to fill?***
Please complete all sections of the questionnaire that relate to your entity.

3. ***Do you need assistance?***

Our interviewers are available for guidance on how to complete this questionnaire. In addition, the following personnel may be contacted for further inquiries or clarifications:

Contact persons	Telephone/Fax	E-mail/Website
Bashir Kagere	T. +256 414 705 531 M. +256 712 956 556	b.kagere@uncst.go.ug
Dickson Avutia	T. +256 414 705 531 M. +256 772 694 699	d.avutia@uncst.go.ug

4. ***What do I do after completing the questionnaire?***

The duly filled questionnaire will be collected by the interviewer or can be returned to the office of the Executive Secretary, Uganda National Council for Science and Technology: Plot 6, Kimera Road, Ntinda, Science and Technology House, P. O. Box 6884 Kampala, Tel: +256 414 705 531, Fax: +256 414 234 579 before or within **fourteen (14) days** from the date of delivery. Respondents submitting the questionnaire electronically should send completed returns to email: **info@uncst.go.ug**

6. ***Will there be any feedback?***
Yes! As a way of promoting dialogue we will share with you the results of this survey in aggregate form and seek your further involvement in this exercise. Aggregated results will also be posted on the following website: *http://www.uncst.go.ug*.

THANK YOU FOR YOUR CONTINUED COOPERATION

C. Definitions

What is Research & Development?

This survey follows the approach of the Organisation for Economic Co-operation and Development (OECD) as adopted in 2007 during the first meeting of the African Inter-governmental Committee on Science, Technology and Innovation Indicators in Maputo (Mozambique). It defines Research and Experimental Development (R&D) as:

- Research is creative work and original investigation undertaken on a systematic basis to gain new knowledge, including knowledge of humanity, culture and society.
- Development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products, services or processes.

The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned.

What does R&D include?

Activities of personnel who are obviously engaged in R&D. In addition include:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D
- Management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support to those performing R&D
- Software development where the aim of the project is the systematic resolution of a scientific or technological uncertainty
- Research work in the biological, physical and social sciences, and the humanities
- Social science research including economic, cultural, educational, psychological and sociological research
- Research work in engineering and the medical sciences
- R&D projects performed for other parties
- "Feedback R&D" directed at solving problems occurring beyond the original R&D phase, for example technical problems arising during initial production runs.

What does R&D Exclude?

The following ROUTINE activities are excluded, except where they are an essential part of in-house R&D activity:

- Scientific and technical information services
- Engineering and technical services
- General purpose or routine data collection
- Standardisation and routine testing
- Feasibility studies (except into R&D projects)
- Specialised routine medical care, for example routine pathology services
- The commercial, legal and administrative aspects of patenting, copyrighting or licensing activities
- Routine computer programming, systems work or software maintenance where there are no technological uncertainties to be resolved.

Fields of Science and Technology Classification	
1. Natural Sciences • Mathematics and computer sciences • Physical sciences • Chemical sciences • Earth and related environmental sciences • Biological sciences **2. Engineering and Technology** • Civil engineering • Electrical engineering, electronics • Other engineering sciences **3. Medical and Health Sciences** • Basic medicine • Clinical medicine • Health sciences	**4. Agricultural Sciences** • Agriculture, forestry, fisheries and allied sciences • Veterinary medicine **5. Social Sciences** • Psychology • Economics • Educational sciences • Other social sciences **6. Humanities** • History • Languages and literature • Other humanities

PART 1: GENERAL INFORMATION

1a. What is the Registered name of the Company?

1b. What is the Trading name of the Company/Business if different from 1a above?

1c. Which Year did the Company start operating in Uganda?

1d. Are you part of a Group Enterprise/Larger Group?

Yes	No

1e. What is the Name of the Parent Company (if applicable)

2a. Approximate foreign/local ownership split (By ultimate ownership if complex holding structures exist.)

Country	Percentage
1.	
2.	
3.	
4.	
5.	

2b. If you are reporting R&D for subsidiary companies (e.g. as a head office with several subsidiary companies), please list the companies below (append a page if required).

(Official use only)

	Name of the Company	District	District Code
1.			
2.			
3.			
4.			
5.			

3. Principal Activity of Business?

ISIC CODE (Official use only)

3a. What is the principal Activity of your Business?	(A111)

3b.What are the other (secondary) activities of your business?
(if necessary, please continue on separate sheets)

ISIC CODE

		(A113)
		(A114)
		(A115)
		(A116)

4. List your main products and/or services in their order of importance:
(if necessary, please continue on separate sheets)

(Official use only)

	Product/Service	% of Importance	CPC Code
P01			
P02			
P03			
P04			
P05			

5. Give the total number of employees, including staff on contract for six months or longer), on the last payday in:

	Dec 2009			Dec 2010			Dec 2011		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	M	F	T	M	F	T	M	F	T
Full-time employees									
Part time employees									
Casual employees									
Total Employees									

6. Gross Sales Revenue or Turnover (Uganda Shillings excl. all taxes)

2009	2010	2011

7. International purchases and sales of technology and technological 'know-how'

International flows (purchases / sales) of technology and technical know-how?
This question measures international flows of industrial property and know-how.

Please **include** purchases or sales on the following operations: patents; licences for patents; know-how (not patented); models and designs; trademarks (including technology franchising); technical services; finance of industrial R&D outside national territory.

Please **exclude** purchases or sales on the following operations: commercial, financial, managerial and legal assistance; advertising; insurance; transport; films, recordings, material covered by copyright; design; software.

Ushs. (excluding all taxes)

7a. Purchases of technology and know-how from outside Uganda:

7b. Sales of technology and know-how to outside Uganda:

8. Did the company perform any IN-HOUSE R&D in UGANDA during the year 2010?

- *In-house R&D refers to R&D performed by the reporting unit on its own behalf or on behalf of others.*
- *It excludes R&D projects funded by this organisation but carried out by others using their own facilities.*
- *In-house R&D must be distinguished from outsourced R&D which should be reported under part 5.*
- *Only R&D performed in UGANDA should be recorded.*

Yes ☐ Continue with Question 9 - 19

No ☐ Proceed to Parts 5-7: Questions 14 to 19 on Outsourced R&D, Collaborative R&D, and Research Outputs.

☐ If your company does *not* do any In-House and/or any Outsourced R&D, please provide comment on your non-involvement in R&D in the box below.

PART 2: IN-HOUSE R&D PERSONNEL

9. Who among your staff performed/engaged in any R&D activity in 2010?

*Please list down ALL personnel connected with your institution that performed / engaged in any R&D activity at any given time during the period **1st January 2010 to 31st December2010** including some of their characteristics. Include also personnel who are no longer connected but who were engaged in any R&D activity performed in your institution during the reference period (e.g. resigned/ retired staff, project personnel). If necessary please continue on a separate sheet.*

LINE NUMBER	NAME OF PERSONNEL	GENDER M-Male F-Female	AGE 1 <25 2 25-30 3 31-34 4 35-40 5 41-44 6 45-50 7 51-54 8 55-60 9 61-64 10 65-70 11 71-74 12 >75	HIGHEST EDUCATIONAL ATTAINMENT	
				Enter code	Specify course / area of specialisation at highest level
(1)	(2)	(3)	(4)	(5)	(6)
Ex	Mafabi Patrick	M	11	2	Civil Engineering
01					
02					
03					
04					
04					
05					
06					
07					
08					
09					
10					
11					
12					

CODES FOR COL (5)-Highest Education Attainment

1. Post-doc, PhD, Doctorate
2. Masters
3. Bachelors
4. Higher Diplomas
5. Ordinary Diplomas, Certificates

Researchers: Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the planning and management of the projects concerned.

Technicians directly supporting R&D: Persons doing technical tasks in support of R&D, normally under the direction and supervision of a Researcher.

Other personnel directly supporting R&D: Other supporting staff includes skilled and unskilled crafts persons, secretarial and clerical staff participating in R&D projects or directly associated with such Projects.

NOTE: Do not include personnel indirectly supporting R&D: Typical examples are transportation, storage, cleaning, repair, maintenance and security activities, as well as administration and clerical activities undertaken not exclusively for R&D (such as the activities of central finance and personnel departments).Allowance for these should be made under overheads in R&D expenditure (current expenditure – Question 10H) but such persons should not be included as R&D Personnel.

Please provide corresponding information for each person engaged in ANY R&D regardless of the number of projects engaged in during the period 1st January 2010 to 31st December 2010: Only one entry per individual

LINE NUMBER	FIELD OF SCIENCE AND TECHNOLOGY/ CURRENT AREA OF R&D WORK (FIELD OF RESEARCH)		CATEGORY OF R&D PERSONNEL (ENTER CODE)	STATUS OF APPOINTMENT WITH INSTITUTION WHILE DOING R&D (ENTER CODE)	NUMBER OF MONTHS ENGAGED IN R&D DURING THE REFERENCE PERIOD	AVERAGE NUMBER OF HOURS PER WEEK SPENT ON R&D
	ENTER CODE	SPECIFY**				
(7)	(8)	(9)	(10)	(11)	(12)	(13)
Ex	2	Materials Sciences	1	2	12	35
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						

CODES FOR COL (8) - Field of S&T

1. Natural Sciences
2. Engineering and Technology
3. Agricultural Sciences
4. Medical sciences
5. Social Sciences
6. Humanities

CODES FOR COL (10) - Category of R&D Personnel

1. Researcher
2. Technician
3. Support Staff

CODES FOR COL (11) - Status of appointment

1. Permanent
2. Contractual
3. Temporary

Refers to the specific area of research under the identified field of S&T (see page 6).

PART 3: IN-HOUSE R&D EXPENDITURE IN 2010

10. Allocate In-House R&D Expenditure as Follows

CAPITAL EXPENDITURE ON R&D (2010)

- The full value of capital expenditure must be reported in the year of purchase (do not depreciate).
- If the asset has been/will be used for more than one activity, **include an estimate of the portion used for R&D**.

Including - but not limited to:	*Excluding:*
• Expenditure on fixed assets used in the R&D projects of your business. • Acquisition of software for R&D, including fees, expected to be used for more than one year. • Purchase of databases expected to be used for more than one year. • Major repairs and improvements on land and buildings used for R&D.	• Other repairs and maintenance expenses. • Depreciation provisions. • Proceeds from the sale of R&D assets.

		Ushs. (excluding all taxes)
Land and buildings	A	
Plant and machinery	B	
Vehicles	C	
Computers and related equipment	D	
Other office equipment	E	
Work in progress for capital assets	F	

LABOUR COSTS OF R&D PERSONNEL (2010)

		Ushs. (excluding all taxes)
Labour Costs of R&D personnel (To match Question 9)	G	

OTHER CURRENT EXPENDITURE ON R&D (2010)

Including - but not limited to:	*Excluding:*
• Materials, fuels and other inputs (including all running costs). • Water, electricity and other overhead expenses. • Repair and maintenance expenses. • Payments to outside organisations for use of specialised testing facilities. • Payments to outside organisations for analytical work, engineering or other specialised services in support of R&D projects carried out by this department/unit. • Commission/consultant expenses for research projects carried out by this department/unit. • Other R&D expenses and indirect costs not classified in 10A to 10G. • The relevant % of labour costs of persons providing indirect services such as Head Office, HR, Finance, Security,	• R&D activities where the research project is carried out elsewhere by others on behalf of your business. • Payments for purchases of technical know-how. • Payments for patent searches. • Depreciation provisions.

Maintenance Personnel, Staff of Central Libraries, IT Departments.		

		Ushs. (excluding all taxes)
Other Current Expenditure **(utilities, transport, communication, staff training, rent, and maintenance)**	**H**	

		Ushs. (excluding all taxes)
TOTAL R&D EXPENDITURE (A + B + C + D + E + F + G + H) = I	**I**	

11. Sources of Funds for In-House R&D in 2010

Provide a breakdown of the total R&D expenditure (as reported in question 10) according to sources of funds.

Organisation	Ushs. (excluding all taxes)
Own funds - refer to Company's own budget (own generated funds)	
Government - refer to funds provided by government Ministries, Departments or Agencies	
Business (Domestic only) - refer to funds provided by local business sector	
Private Funds - refer to funds provided by private non-profit institutions and individual donations	
Foreign Funds - refer to funds provided by parent company, foundations and other foreign sources	
Other Sources (please specify)	
	Ushs. (excluding all taxes)
TOTAL R&D EXPENDITURE	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE IN 2010

12. In-House R&D Current Expenditure by Type of R&D (2010)

Specify the percentage of total IN-HOUSE CURRENT R&D expenditure by type of R&D.

Basic Research

- Work undertaken primarily to extend the boundaries of disciplinary knowledge with no particular application in view.
- Analyses of properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws.
- The results of basic research are usually published in peer-reviewed scientific journals.

Percentage

Applied Research

- Original investigation to acquire new knowledge with a specific application in view.
- Activities that determine the possible uses for the findings of basic research.
- The results of applied research are intended primarily to be valid for a single or limited number of products, operations, methods or systems.
- Applied research develops ideas into operational form and may be published in peer-reviewed journals or subjected to other forms of intellectual property protection.

Percentage

Experimental Development

- Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed.

Percentage

TOTAL	**1**	**0**	**0**

13a. Multi-Disciplinary R&D (2010)

Please estimate the percentage of R&D expenditure allocated to the following areas:

- Multi-disciplinary R&D combines several research fields or disciplines. If your organisation performs such R&D, as described below, please provide the applicable percentage of total R&D Expenditure.
- Note that the percentages will most likely not total 100%.

Example: The development of a malaria vaccine could involve the fields and/or disciplines of ethno-botany & pharmacology, and economics & law.

Multidisciplinary Area of R&D (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

No Multi-Disciplinary R&D	☐	← TICK if no such R&D is done

13b. R&D in National Development Priorities (2010)

Please estimate the percentage of R&D expenditure allocated to the national development priorities, e.g. addressing the Millennium Development Goals (MDGs), Agricultural Modernisation, Industrialisation & Private Sector Competitiveness, Poverty Eradication & Wealth Creation:

Priority Areas of Interest (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

PART 5: R&D OUTSOURCED AND/OR CONTRACTED OUT IN 2010

Outsourced R&D refers to:
- Outsourced or extramural expenditures being the amounts a reporting unit paid or committed to pay to another organisation for the performance of R&D during a specific period.
- This includes acquisition of R&D performed by and/or grants given to other organisations for performing R&D

	Ushs. (excluding all taxes)
14. State value of R&D outsourced **inside** UGANDA	

	Ushs. (excluding all taxes)
15. State value of R&D outsourced **outside** UGANDA	

16. If the amount stated in **question 14 or 15** is in excess of **100 million Uganda Shillings**, please indicate the name of the organisation(s) that conducted the outsourced R&D with the associated expenditure.

State details of R&D outsourced **inside** UGANDA.

Outsourced to:	**Approximate Value** **Ushs. (excluding all taxes)**
1.	
2.	
3.	
4.	
5.	

State details of R&D outsourced **outside UGANDA**

Outsourced to:	Approximate Value **Ushs. (excluding all taxes)**
1.	
2.	
3.	
4.	
5.	

PART 6: COLLABORATIVE R&D IN 2010

17a. With whom is R&D conducted in partnerships, alliances or collaboration?

A single project may be undertaken in collaboration with several national and/or foreign partners.

Organizations with which you have collaborated with	Number of R&D projects	
	NATIONAL PARTNERS	FOREIGN PARTNERS
Higher Education Institutions		
Science Councils		
Government Research Institutes		
Private sector (domestic only)		
Other Companies		
Not-for-profit organisations		
Foreign Organisations		
TOTALS		
NO COLLABORATION (please tick)	☐	☐

17b. Please state the areas (R&D projects) of collaboration

NATIONAL PARTNERS	FOREIGN PARTNERS

PART 7: RESEARCH OUTPUTS IN 2010

18a. Did your company/business apply for Intellectual Property during the period 1st January 2010 to 31st December 2010? How many?

1. Yes ..... ☐ If yes, proceed to **18b**.
2. No ..... ☐

18b. Please state the number of IP assets applied for and granted to your company (if any) in 2010 within in the appropriate boxes

	Type of IP Asset	IP Rights Applied for	IP Rights Granted
a.	Utility models		
b.	Industrial designs		
c.	Integrated circuits		
d.	Trademarks		
e.	Patents		
f.	Copyrights		
g.	Service marks		

19. Have you published scientific papers in local or international journals for the last five (5) years?

Yes ☐ No ☐

If yes, please indicate scientific paper and international publications:

Title of Scientific Paper/Publication	Name of Journal / Year of Publication			
	Local	Year	International	Year

Comments from the Respondent

.....

.....

.....

.....

.....

.....

.....

.....

.....

Signature..... **Date:** .....

THANK YOU FOR YOUR COOPERATION

Appendix 2: Government R&D Survey

UNCST Clearance

U	N	C	S	T	-	2	0	1	2	-	0	1

RESEARCH & DEVELOPMENT SURVEY (R&D) 2012

GOVERNMENT QUESTIONNAIRE

Reference Period: 2010/2011

The Uganda National Council for Science and Technology (UNCST) is responsible for the development and implementation of policies and strategies for integrating Science and Technology into the national development process

Please help us measure the level of Research and Development (R&D) in the Government Sector

April 2012

RESEARCH AND DEVELOPMENT SURVEY

A. Background

1. ***Introduction***
The Uganda National Council for Science and Technology (UNCST) is conducting a comprehensive Research & Development Survey in Uganda following the pilot survey undertaken in 2009. The survey will collect data on the status and levels of Research and Development in the Government sector for the period 2010/2011.

2. ***What is the Legal Mandate to collect this data?***
The UNCST is empowered to collect this data by the **UNCST Statute CAP 209** of the Laws of Uganda. The information provided by your entity will be treated with strict **confidentiality** in line with the Uganda Bureau of Statistics (UBOS) Act of 1998 and will be used only in aggregated statistical format for analysis and policy formulation purposes.

The interviewers and staff involved in the R&D survey are under oath of secrecy not to disclose any entity-specific information to a third party individual/entity. The data/information collected will only be published in aggregate form.

3. ***Why do we need to collect this information?***
The information is a key input in the compilation of the Gross Domestic Expenditure on Research and Development (GERD) – the sum of R&D expenditures in the following four economic sectors: business, government, higher education, and private non-profit. The GERD measures R&D on a national scale in order to guide the formulation, implementation and review of Science, Technology and Innovation (STI) policies.

4. ***How do you benefit?***
The R&D surveys are a rich source of information that facilitates effective planning and policy formulation with respect to Science, Technology and Innovation, which benefits both the public and private sectors. The surveys generate data that enable the design and implementation of interventions that specifically address national, sectoral and local needs.

B. Guidelines

1. ***Who needs to complete this questionnaire?***
The Chief Executive Officer or a suitable representative of the targeted entity shall fill the questionnaire.

2. ***Which parts of the questionnaire do I have to fill?***
Please complete all sections of the questionnaire that relate to your entity.

3. ***Do you need assistance?***

Our interviewers are available for guidance on how to complete this questionnaire. In addition, the following offices are open for any further inquiries or clarifications:

Contact persons	Telephone/Fax	E-mail/Website
Catherine Munabi Tukacungurwa	T. +256 414 705 531 M. +256 712 333 692	c.munabi@uncst.go.ug
Immaculate Nakamya Muyingo	T. +256 414 705 531 M. +256 712 375 462	i.nakamya@uncst.go.ug

4. ***What do I do after completing the questionnaire?***

The duly filled questionnaire will be collected by the interviewer or can be returned to the office of the Executive Secretary, Uganda National Council for Science and Technology: Plot 6, Kimera Road, Ntinda, Science and Technology House, P. O. Box 6884 Kampala, Tel: +256 414 705 531, Fax: +256 414 234 579 before or within **fourteen (14) days** from the date of delivery. Respondents submitting the questionnaire electronically should send completed returns to email: **info@uncst.go.ug**

6. ***Will there be any feedback?***
Yes! As a way of promoting dialogue we will share with you the results of this survey in aggregate form and seek your further involvement in this exercise. Aggregated results will also be posted on the following website: *http://www.uncst.go.ug*.

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This survey follows the approach of the Organisation for Economic Co-operation and Development (OECD) as adopted in 2007 during the first meeting of the African Inter-governmental Committee on Science, Technology and Innovation Indicators in Maputo (Mozambique). It defines Research and Experimental Development (R&D) as:

- Research is creative work and original investigation undertaken on a systematic basis to gain new knowledge, including knowledge of humanity, culture and society.
- Development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products, services or processes.

The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned.

What does R&D include?

Activities of personnel who are obviously engaged in R&D. In addition include:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D
- Management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support to those performing R&D
- Software development where the aim of the project is the systematic resolution of a scientific or technological uncertainty
- Research work in the biological, physical and social sciences, and the humanities
- Social science research including economic, cultural, educational, psychological and sociological research
- Research work in engineering and the medical sciences
- R&D projects performed for other parties
- "Feedback R&D" directed at solving problems occurring beyond the original R&D phase, for example technical problems arising during initial production runs.

What does R&D Exclude:

The following ROUTINE activities are excluded , except where they are an essential part of in-house R&D activity:

- Scientific and technical information services
- Engineering and technical services
- General purpose or routine data collection
- Standardisation and routine testing
- Feasibility studies (except into R&D projects)
- Specialised routine medical care, for example routine pathology services
- The commercial, legal and administrative aspects of patenting, copyrighting or licensing activities
- Routine computer programming, systems work or software maintenance where there are no technological uncertainties to be resolved.

Fields of Science and Technology Classification	
1. Natural Sciences • Mathematics and computer sciences • Physical sciences • Chemical sciences • Earth and related environmental sciences • Biological sciences **2. Engineering and Technology** • Civil engineering • Electrical engineering, electronics • Other engineering sciences **3. Medical and Health Sciences** • Basic medicine • Clinical medicine • Health sciences	**4. Agricultural Sciences** • Agriculture, forestry, fisheries and allied sciences • Veterinary medicine **5. Social Sciences** • Psychology • Economics • Educational sciences • Other social sciences **6. Humanities** • History • Languages and literature • Other humanities

PART 1: GENERAL INFORMATION

1	Name of Ministry/ Department/ Agency?

1a	What is the name of the reporting Organisation if different from **1** above

2. Principal Function of the Ministry/Department/Agency? ISIC CODE (Official use only)

2a. What is the principal function of the Ministry or Department or Agency?	1

2b.What are any other (secondary) functions/activities of your Ministry or Department or Agency?
(if necessary, please continue on separate sheets) ISIC CODE

		2
		3
		4
		5

3. What are your main Products and/or Services?
(if necessary, please continue on separate sheets)

	Product and/or Service	(Official use only) CPC Code
P01		
P02		
P03		
P04		
P05		

4. Give the total number of employees working for the reporting organisation in 2009 to 2011?[1] (*include staff on contract for six months or longer*):

	2009			2010			2011		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	M	F	T	M	F	T	M	F	T
Full-time employees									
Part time employees									
Casual employees									
Total Employees									

[1] Annual average. If not available, give the number of employees at the end of each year. Give figures to six digits.

5. Did the reporting organisation or unit perform any **IN-HOUSE R&D** in UGANDA during the **2010/2011** financial year?

- *In-house R&D refers to R&D performed by the reporting unit on its own behalf or on behalf of others.*
- *It excludes R&D projects funded by this organisation but carried out by others using their own facilities.*
- *In-house R&D must be distinguished from outsourced R&D which should be reported under Part 5.*
- *Only R&D performed in UGANDA should be recorded.*

Yes ☐ Continue with Question 6 – 15

No ☐ Proceed to Part 5: Questions 12, 13 and 14 on Outsourced R&D, Collaborative R&D, and Research Outputs

☐ If your reporting organisation or unit does *not* do any In-House and/or any Outsourced R&D, please provide comment on your non-involvement in R&D in the box below.

PART 2: IN-HOUSE R&D PERSONNEL

6. Who among your staff performed/engaged in any R&D activity during the period 1st July 2010 to 30th June 2011?

Please list down ALL personnel connected with your institution that performed / engaged in any R&D activity at any given time during the period 1st July 2010 to 30th June 2011 including some of their characteristics. Include also personnel who are no longer connected but who were engaged in any R&D activity performed in your institution during the reference period (e.g. resigned/ retired staff, project personnel)

LINE NUMBER	NAME OF PERSONNEL	GENDER M-Male F-Female	AGE 1 <25 2 25-30 3 31-34 4 35-40 5 41-44 6 45-50 7 51-54 8 55-60 9 61-64 10 65-70 11 71-74 12 >75	HIGHEST EDUCATIONAL ATTAINMENT	
				Enter code	Specify course / area of specialisation at highest level
(1)	(2)	(3)	(4)	(5)	(6)
Ex	Mafabi Patrick	M	11	2	Civil Engineering
01					
02					
03					
04					
04					
05					
06					
07					
08					
09					
10					
11					
12					

CODES FOR COL (5)-Highest Education Attainment	
1. Post-doc, PhD, Doctorate 2. Masters 3. Bachelors 4. Higher Diplomas 5. Ordinary Diplomas, Certificates	**Researchers:** Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the planning and management of the projects concerned. **Technicians directly supporting R&D:** Persons doing technical tasks in support of R&D, normally under the direction and supervision of a Researcher. **Other personnel directly supporting R&D:** Other supporting staff includes skilled and unskilled crafts persons, secretarial and clerical staff participating in R&D projects or directly associated with such Projects. **NOTE:** Do not include personnel indirectly supporting R&D: Typical examples are transportation, storage, cleaning, repair, maintenance and security activities, as well as administration and clerical activities undertaken not exclusively for R&D (such as the activities of central finance and personnel departments).Allowance for these should be made under overheads in R&D expenditure (current expenditure – Question 7H) but such persons should not be included as R&D Personnel.

Please provide corresponding information for each person engaged in ANY R&D regardless of the number of projects engaged in during the period 1st July 2010 to 30th June 2011: Only one entry per individual

LINE NUMBER	FIELD OF SCIENCE AND TECHNOLOGY/ CURRENT AREA OF R&D WORK (FIELD OF RESEARCH)		CATEGORY OF R&D PERSONNEL (ENTER CODE)	STATUS OF APPOINTMENT WITH INSTITUTION WHILE DOING R&D (ENTER CODE)	NUMBER OF MONTHS ENGAGED IN R&D DURING THE REFERENCE PERIOD	AVERAGE NUMBER OF HOURS PER WEEK SPENT ON R&D
	ENTER CODE	SPECIFY**				
(7)	(8)	(9)	(10)	(11)	(12)	(13)
Ex	2	Materials Sciences	1	2	12	35
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						

CODES FOR COL (8) - Field of S&T

1. Natural Sciences
2. Engineering and Technology
3. Agricultural Sciences
4. Medical sciences
5. Social Sciences
6. Humanities

CODES FOR COL (10) - Category of R&D Personnel

1. Researcher
2. Technician
3. Support Staff

CODES FOR COL (11) - Status of appointment

1. Permanent
2. Contractual
3. Temporary

**Refers to the specific area of research under the identified field of S&T (see page 5).

PART 3: IN-HOUSE R&D EXPENDITURE IN 2010/2011

7. Allocate In-House R&D Expenditure as Follows

CAPITAL EXPENDITURE ON R&D (2010/2011)

- The full value of capital expenditure must be reported in the year of purchase (do not depreciate).
- If the asset has been/will be used for more than one activity, **include an estimate of the portion used for R&D**.

Including - but not limited to:	*Excluding:*
• Expenditure on fixed assets used in the R&D projects of your business. • Acquisition of software for R&D, including fees, expected to be used for more than one year. • Purchase of databases expected to be used for more than one year. • Major repairs and improvements on land and buildings used for R&D.	• Other repairs and maintenance expenses. • Depreciation provisions. • Proceeds from the sale of R&D assets.

		Ushs. (excluding all taxes)
Land and buildings	**A**	
Plant and machinery	**B**	
Vehicles	**C**	
Computers and related equipment	**D**	
Other office equipment	**E**	
Work in progress for capital assets	**F**	

LABOUR COSTS OF R&D PERSONNEL (2010/2011)

		Ushs. (excluding all taxes)
Labour Costs of R&D personnel (To match Question 6)	**G**	

OTHER CURRENT EXPENDITURE ON R&D (2010/2011)

Including - but not limited to:	*Excluding:*
• Materials, fuels and other inputs (including all running costs). • Water, electricity and other overhead expenses. • Repair and maintenance expenses. • Payments to outside organisations for use of specialised testing facilities. • Payments to outside organisations for analytical work, engineering or other specialised services in support of R&D projects carried out by this department/unit. • Commission/consultant expenses for research projects carried out by this department/unit. • Other R&D expenses and indirect costs not classified in 7A to 7G. • The relevant % of labour costs of persons providing indirect services such as Head Office, HR, Finance, Security,	• R&D activities where the research project is carried out elsewhere by others on behalf of your business. • Payments for purchases of technical know-how. • Payments for patent searches. • Depreciation provisions.

Maintenance Personnel, Staff of Central Libraries, IT Departments.		

		Ushs. (excluding all taxes)
Other Current Expenditure **(utilities, transport, communication, staff training, rent, and maintenance)**	**H**	

		Ushs. (excluding all taxes)
TOTAL R&D EXPENDITURE (A + B + C + D + E + F + G + H) = I	**I**	

8. Sources of Funds for In-House R&D (2010/2011)

Provide a breakdown of the total R&D expenditure (as reported in question 7) according to sources of funds.

Organisation	Ushs. (excluding all taxes)
Own funds - refer to Institution's own generated funds	
Government - refer to funds provided by government Ministries, Departments or Agencies	
Business (Domestic only) - refer to funds provided by business sector	
Private Funds - refer to funds provided by private non-profit institutions / individuals	
Foreign Funds - refer to funds provided by international organisations and bodies, foreign firms or individuals	
Other Sources (please specify)	
	Ushs. (excluding all taxes)
TOTAL R&D EXPENDITURE	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE IN 2010/2011

9. In-House R&D Current Expenditure by Type of R&D (2010/2011)

Specify the percentage of total IN-HOUSE CURRENT R&D expenditure by type of R&D.

Basic Research

	Percentage
• Work undertaken primarily to extend the boundaries of disciplinary knowledge with no particular application in view. • Analyses of properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws. • The results of basic research are usually published in peer-reviewed scientific journals.	

Applied Research

	Percentage
• Original investigation to acquire new knowledge with a specific application in view. • Activities that determine the possible uses for the findings of basic research. • The results of applied research are intended primarily to be valid for a single or limited number of products, operations, methods or systems. • Applied research develops ideas into operational form and may be published in peer-reviewed journals or subjected to other forms of intellectual property protection.	

Experimental Development

	Percentage
• Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed.	

TOTAL	**1**	**0**	**0**	

10a. Multi-Disciplinary R&D (2010/2011)

Please estimate the percentage of R&D expenditure allocated to the following areas:

- Multi-disciplinary R&D combines several research fields or disciplines. If your organisation performs such R&D, as described below, please provide the applicable percentage of total R&D Expenditure.
- Note that the percentages will most likely not total 100%.

Example: The development of a malaria vaccine could involve the fields and/or disciplines of ethno-botany & pharmacology, and economics & law.

Multidisciplinary Area of R&D (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

No Multi-Disciplinary R&D	☐ ← TICK if no such R&D is done

10b. R&D in National Development Priorities (2010/2011)

Please estimate the percentage of R&D expenditure allocated to the national development priorities, e.g. addressing the Millennium Development Goals (MDGs), Agricultural Modernisation, Industrialisation & Private Sector Competitiveness, Poverty Eradication & Wealth Creation:

Priority Areas of Interest (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

PART 5: R&D OUTSOURCED AND/OR CONTRACTED OUT IN 2010/2011

Outsourced R&D refers to:
- Outsourced or extramural expenditures being the amounts a reporting unit paid or committed to pay to another organisation for the performance of R&D during a specific period.
- This includes acquisition of R&D performed by and/or grants given to other organisations for performing R&D

	Ushs. (excluding all taxes)
11. State value of R&D outsourced **inside** UGANDA	

	Ushs. (excluding all taxes)
12. State value of R&D outsourced **outside** UGANDA	

13. If the amount stated in **question 11 or 12** is in excess of **100 million Uganda Shillings**, please indicate the name of the organisation(s) that conducted the outsourced R&D with the associated expenditure.

State details of R&D outsourced **inside** UGANDA.

Outsourced to:	Approximate Value Ushs. (excluding all taxes)
1.	
2.	
3.	
4.	
5.	

State details of R&D outsourced **outside UGANDA**

Outsourced to:	Approximate Value Ushs. (excluding all taxes)
1.	
2.	
3.	
4.	
5.	

PART 6: COLLABORATIVE R&D IN 2010/2011

14a. With whom is R&D conducted in partnerships, alliances or collaboration?

A single project may be undertaken in collaboration with several national and/or foreign partners.

Organizations with which you have collaborated with	Number of R&D projects	
	NATIONAL PARTNERS	FOREIGN PARTNERS
Higher Education Institutions		
Science Councils		
Government Research Institutes		
Private sector (domestic only)		
Other Companies		
Not-for-profit organisations		
Foreign Organisations		
TOTALS		
NO COLLABORATION (please tick)	☐	☐

14b. Please state the areas of R&D collaboration

NATIONAL PARTNERS	FOREIGN PARTNERS

PART 7: RESEARCH OUTPUTS IN 2010/2011

15a. Did your organization/department apply for Intellectual Property Rights during the period 1 July 2010 to 31 June 2011?

1. Yes ..... ☐ If yes, proceed to **15b**.
2. No ..... ☐

15b. Please state the number of IP rights applied for and granted to your institution /firm (if any) in 2010/2011 within in the appropriate boxes

	Type of IP Rights	IP Rights Applied for	IP Rights Granted
a.	Utility models		
b.	Industrial designs		
c.	Integrated circuits		
d.	Trademarks		
e.	Patents		
f.	Copyrights		
g.	Service marks		

16. Have you published scientific papers in local or international journals for the last five (5) years?

Yes ☐ No ☐

If yes, please indicate scientific paper and international publications:

Title of Scientific Paper/Publication	Type of Journal / Year of Publication			
	Local	Year	International	Year

Comments from the Respondent

.....

.....

.....

.....

.....

.....

.....

.....

.....

Signature..... **Date:** .....

THANK YOU FOR YOUR COOPERATION

Appendix 3: Higher Education R&D Survey

UNCST Clearance

U	N	C	S	T	-	2	0	1	2	-	0	2

RESEARCH & DEVELOPMENT SURVEY (R&D) 2012

HIGHER EDUCATION QUESTIONNAIRE

Reference Period: 2010/2011

The Uganda National Council for Science and Technology (UNCST) is responsible for the development and implementation of policies and strategies for integrating Science and Technology into the national development process

Please help us measure the level of Research and Development (R&D) in the Higher Education Sector

April 2012

Research and Development Survey (R&D), 2012

A. Background

1. ***Introduction***
The Uganda National Council for Science and Technology (UNCST) is conducting a comprehensive Research & Development Survey in Uganda following the pilot survey undertaken in 2009. The survey will collect data on the status and levels of Research and Development in the Higher Education sector for the period 2010/2011.

2. ***What is the Legal Mandate to collect this data?***
The UNCST is empowered to collect this data by the **UNCST Statute CAP 209** of the Laws of Uganda. The information provided by your entity will be treated with strict **confidentiality** in line with the Uganda Bureau of Statistics (UBOS) Act of 1998 and will be used only in aggregated statistical format for analysis and policy formulation purposes.

The interviewers and staff involved in the R&D survey are under oath of secrecy not to disclose any entity-specific information to a third party individual/entity. The data/information collected will only be published in aggregate form.

3. ***Why do we need to collect this information?***
The information is a key input in the compilation of the Gross Domestic Expenditure on Research and Development (GERD) – the sum of R&D expenditures in the following four economic sectors: business, government, higher education, and private non-profit. The GERD measures R&D on a national scale in order to guide the formulation, implementation and review of Science, Technology and Innovation (STI) policies.

4. ***How do you benefit?***
The R&D surveys are a rich source of information that facilitates effective planning and policy formulation with respect to Science, Technology and Innovation, which benefits both the public and private sectors. The surveys generate data that enable the design and implementation of interventions that specifically address national, sectoral and local needs.

B. Guidelines

1. ***Who needs to complete this questionnaire?***
The Chief Executive Officer or a suitable representative of the targeted entity shall fill the questionnaire.

2. ***Which parts of the questionnaire do I have to fill?***
Please complete all sections of the questionnaire that relate to your entity.

3. ***Do you need assistance?***

Our interviewers are available for guidance on how to complete this questionnaire. In addition, the following personnel may be contacted for further inquiries or clarifications:

Contacts	Telephone/Fax	E-mail/Website
Suleyman Sebbale	T. +256 414 705 531 M.+256 774 438 372	s.sebbale@uncst.go.ug ssebbale@yahoo.com

4. ***What do I do after completing the questionnaire?***

The duly filled questionnaire will be collected by the interviewer or can be returned to the office of the Executive Secretary, Uganda National Council for Science and Technology: Plot 6, Kimera Road, Ntinda, Science and Technology House, P. O. Box 6884 Kampala, Tel: +256 414 705 531, Fax: +256 414 234 579 before or within **fourteen (14) days** from the date of delivery. Respondents submitting the questionnaire electronically should send completed returns to email: **info@uncst.go.ug**

6. ***Will there be any feedback?***
Yes! As a way of promoting dialogue we will share with you the results of this survey in aggregate form and seek your further involvement in this exercise. Aggregated results will also be posted on the following website: *http://www.uncst.go.ug*.

THANK YOU FOR YOUR CONTINUED COOPERATION

C. Definitions

What is Research & Development?
This survey follows the approach of the Organisation for Economic Co-operation and Development (OECD) as adopted in 2007 during the first meeting of the African Inter-governmental Committee on Science, Technology and Innovation Indicators in Maputo (Mozambique). It defines Research and Experimental Development (R&D) as:

- Research is creative work and original investigation undertaken on a systematic basis to gain new knowledge, including knowledge of humanity, culture and society.
- Development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products, services or processes.

The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned.

What does R&D include:
Activities of personnel who are obviously engaged in R&D. In addition include:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D
- Management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support to those performing R&D
- Software development where the aim of the project is the systematic resolution of a scientific or technological uncertainty
- Research work in the biological, physical and social sciences, and the humanities
- Social science research including economic, cultural, educational, psychological and sociological research
- Research work in engineering and the medical sciences
- R&D projects performed for other parties
- "Feedback R&D" directed at solving problems occurring beyond the original R&D phase, for example technical problems arising during initial production runs.

What does R&D Exclude:
The following ROUTINE activities are excluded , except where they are an essential part of in-house R&D activity:

- Scientific and technical information services
- Engineering and technical services
- General purpose or routine data collection
- Standardisation and routine testing
- Feasibility studies (except into R&D projects)
- Specialised routine medical care, for example routine pathology services
- The commercial, legal and administrative aspects of patenting, copyrighting or licensing activities
- Routine computer programming, systems work or software maintenance where there are no technological uncertainties to be resolved.

Fields of Science and Technology Classification	
1. Natural Sciences • Mathematics and computer sciences • Physical sciences • Chemical sciences • Earth and related environmental sciences • Biological sciences **2. Engineering and Technology** • Civil engineering • Electrical engineering, electronics • Other engineering sciences **3. Medical and Health Sciences** • Basic medicine • Clinical medicine • Health sciences	**4. Agricultural Sciences** • Agriculture, forestry, fisheries and allied sciences • Veterinary medicine **5. Social Sciences** • Psychology • Economics • Educational sciences • Other social sciences **6. Humanities** • History • Languages and literature • Other humanities

PART 1: GENERAL INFORMATION

1. Name of Higher Education Agency?

2. What is the name of the reporting Unit, if different from 1 above

3. Principal activity of the reporting Unit? **ISIC CODE**

(Official use only)

3a. What is the principal activity of the reporting Unit?	1

3b. What are any other (secondary) activities of your Unit/Department/Agency?
(if necessary, please continue on separate sheets)

	ISIC
	2
	3
	4
	5

4. What are your main Products and/or Services?
(if necessary, please continue on separate sheets)

	Product/Service	(Official use only) CPC Code
P01		
P02		
P03		
P04		
P05		

5. Give the total number of employees working for the reporting Unit in 2009 to 2011?[1] (*include staff on contract for six months or longer*):

	2009			2010			2011		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	M	F	T	M	F	T	M	F	T
Full-time employees									
Part time employees									
Casual employees									
Total Employees									

[1] Annual average. If not available, give the number of employees at the end of each year. Give figures to six digits.

6. Did the reporting organisation or unit perform any IN-HOUSE R&D in UGANDA during the period 2010/2011?

- *In-house R&D refers to R&D performed by the reporting unit on its own behalf or on behalf of others.*
- *It excludes R&D projects funded by this organisation but carried out by others using their own facilities.*
- *In-house R&D must be distinguished from outsourced R&D which should be reported under Part 5.*
- *Only R&D performed in UGANDA should be recorded.*

Yes ☐ Continue with Question 7 - 19

No ☐ Proceed to Parts 5 to 7: Questions 14 to 19 on Outsourced R&D, Collaborative R&D, and Research Outputs

☐ If your reporting organization or unit does *not* do any In-House and/or any Outsourced R&D, please provide comment on your non-involvement in R&D in the box below.

PART 2: IN-HOUSE R&D PERSONNEL

R&D PERSONNEL

Report against the categories listed below for all personnel employed directly in R&D or providing direct R&D services/support for at least 5% of their time. Do not count any staff NOT supporting research.

Please include permanent, temporary, full-time, part-time and contract staff, as well as joint appointments for provincial hospital staff.

1. Researchers

Include:
- Academic staff engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the direct management of the projects concerned.
- Managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work. Their rank is usually equal or superior to that of persons directly employed as researchers and they are often former or part-time researchers.
- Academic staff involved in research and also studying towards a Masters or Doctoral degree should be included as research staff (not students).

Exclude:
- Managers and directors concerned primarily with budgets and human resources, rather than project management or content (include in other personnel directly supporting R&D).
- Masters and doctoral students and post-doctoral fellows.

2. Technicians directly supporting R&D

- Persons doing technical tasks in support of R&D, normally under the direction and supervision of a researcher.

3. Other personnel directly supporting R&D

3.1 Executive and managerial level
- Executives and directors concerned primarily with budgets and human resources in support of research, rather than project management.

3.2 Administrative and support staff
- Skilled and unskilled crafts workers supporting research.
- Secretarial, administrative and clerical personnel supporting/working on, or directly associated with, R&D activity.

Exclude:
Persons providing *indirect* services such as security and maintenance personnel, staff of central libraries, IT departments or head offices, should be excluded here but the relevant proportion of their labour costs should be included under "Other Current Costs" in Question 10H.

R&D Students
- All Post-doctoral fellows in whichever capacity they are appointed by the institution
- Doctoral students

7. Who among your staff performed/engaged in any R&D activity during the period 1st July 2010 to 30th June 2011?

Please list down ALL personnel connected with your institution that performed / engaged in any R&D activity at any given time during the period 1st July 2010 to 30th June 2011 including some of their characteristics. Include also personnel who are no longer connected but who were engaged in any R&D activity performed in your institution during the reference period (e.g. resigned/ retired staff, project personnel)

LINE NUMBER	NAME OF PERSONNEL	GENDER M-Male F-Female	AGE 1 <25 2 25-30 3 31-34 4 35-40 5 41-44 6 45-50 7 51-54 8 55-60 9 61-64 10 65-70 11 71-74 12 >75	HIGHEST EDUCATIONAL ATTAINMENT	
				Enter code	Specify course / area of specialisation at highest level
(1)	(2)	(3)	(4)	(5)	(6)
Ex	Ateenyi Patrick	M	11	2	Civil Engineering
01					
02					
03					
04					
04					
05					
06					
07					
08					
09					
10					
11					
12					

CODES FOR COL (5)-Highest Education Attainment

1. Post-doc, PhD, Doctorate
2. Masters
3. Bachelors
4. Higher Diplomas
5. Ordinary Diplomas, Certificates

Please provide corresponding information for each person engaged in ANY R&D regardless of the number of projects engaged in during the period 1st July 2010 to 30th June 2011: Only one entry per individual

LINE NUMBER	FIELD OF SCIENCE AND TECHNOLOGY/ CURRENT AREA OF R&D WORK (FIELD OF RESEARCH)		CATEGORY OF R&D PERSONNEL (ENTER CODE)	STATUS OF APPOINTMENT WITH INSTITUTION WHILE DOING R&D (ENTER CODE)	NUMBER OF MONTHS ENGAGED IN R&D DURING THE REFERENCE PERIOD	AVERAGE NUMBER OF HOURS PER WEEK SPENT ON R&D
	ENTER CODE	SPECIFY**				
(7)	(8)	(9)	(10)	(11)	(12)	(13)
Ex	2	Materials Sciences	1	2	12	35
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						

CODES FOR COL (8) - Field of S&T

1. Natural Sciences
2. Engineering and Technology
3. Agricultural Sciences
4. Medical sciences
5. Social Sciences
6. Humanities

CODES FOR COL (10) - Category of R&D Personnel

1. Researcher
2. Technician
3. Support Staff

CODES FOR COL (11) - Status of appointment

1. Permanent
2. Contractual
3. Temporary

**Refers to the specific area of research under the identified field of S&T (see page 6).

8. Headcount of Postgraduate Students, 2010/2011

Provide the Headcount of all R&D post-doctoral fellows and postgraduate students (full-time and part-time students) in this reporting unit according to the categories below.

Postgraduate student categories	Gender		TOTAL
	M	F	
Post-doctoral fellows			
Doctoral Students			
TOTAL			

Carry subtotals over to Q9

9. Percentage Time on Research and Total Costs, 2010/2011

Using the headcounts of all R&D post-doctoral fellows and postgraduate students reported in Q8, provide the time spent on Research and Development according to the categories below. Then provide the total value of salaries, stipends and all bursaries (both internal and external) from all available records.

Postgraduate Student Categories	Headcount (From Q9)		%ge time spent on R&D in 2010		Total value of salaries, stipends & bursaries Ushs. (excluding all taxes)
	M	F	M	F	
Post-doctoral fellows					
Doctoral students					
TOTAL COST OF STUDENTS					

Carry over total value of salaries, stipends and bursaries to Question 10G

PART 3: IN-HOUSE R&D EXPENDITURE IN 2010/2011

10. Allocate In-house R&D Expenditure as Follows

CAPITAL EXPENDITURE ON R&D (2010/2011)

- The full value of capital expenditure must be reported in the year of purchase (do not depreciate).
- If the asset has been/will be used for more than one activity, **include an estimate of the portion used for R&D**.

Including - but not limited to:	*Excluding:*
• Expenditure on fixed assets used in the R&D projects of your business. • Acquisition of software for R&D, including fees, expected to be used for more than one year. • Purchase of databases expected to be used for more than one year. • Major repairs and improvements on land and buildings used for R&D.	• Other repairs and maintenance expenses. • Depreciation provisions. • Proceeds from the sale of R&D assets.

		Ushs. (excluding all taxes)
Land and buildings	A	
Plant and machinery	B	
Vehicles	C	
Computers and related equipment	D	
Other office equipment	E	
Work in progress for capital assets	F	

LABOUR COSTS OF R&D PERSONNEL (2010/2011)

		Ushs. (excluding all taxes)
Labour Costs of R&D personnel (To match Question 7)		
Total cost of R&D postgraduate students (To match question 9)		
TOTAL	G	

OTHER CURRENT EXPENDITURE ON R&D (2010/2011)

Including - but not limited to:	*Excluding:*
• Materials, fuels and other inputs (including all running costs). • Water, electricity and other overhead expenses. • Repair and maintenance expenses. • Payments to outside organisations for use of specialised testing facilities. • Payments to outside organisations for analytical work, engineering or other specialised services in support of R&D projects carried out by this department/unit. • Commission/consultant expenses for research projects carried out by this department/unit. • Other R&D expenses and indirect costs not classified in 10A to 10G.	• R&D activities where the research project is carried out elsewhere by others on behalf of your business. • Payments for purchases of technical know-how. • Payments for patent searches. • Depreciation provisions.

• The relevant % of labour costs of persons providing indirect services such as Head Office, HR, Finance, Security, Maintenance Personnel, Staff of Central Libraries, IT Departments.	

		Ushs. (excluding all taxes)
Other Current Expenditure **(utilities, transport, communication, staff training, rent, and maintenance)**	**H**	

		Ushs. (excluding all taxes)
TOTAL R&D EXPENDITURE (A + B + C + D + E + F + G + H) = I	**I**	

11. Sources of Funds for In-house R&D (2010/2011)

Provide a breakdown of the total R&D expenditure (as reported in question 10) according to sources of funds listed below.

(NOTE: Only the proportion of the money actually SPENT is required, not the total income per source)

SOURCES OF R&D FUNDING		Ushs. (excluding all taxes)
University Own Funds (own-generated funds)		
Higher Education Vote		
National (excl. Higher Education Vote)		
Local Government		
Government Research Institutes		
Funding from other national Agencies		
Science Council Funding		
Domestic Business including industry funds		
Other NATIONAL Sources		
• *Other Higher Education Institutions*		
• *Not for Profit Organisations*		
• *Donations and bequests from Individuals*		
Foreign Sources		
SUB_TOTAL EXTERNAL SOURCES	**J**	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE IN 2010/2011

12. In-House R&D Current Expenditure by Type of R&D (2010/2011)

Specify the percentage of total IN-HOUSE CURRENT R&D expenditure by type of R&D.

Basic Research

	Percentage
• Work undertaken primarily to extend the boundaries of disciplinary knowledge with no particular application in view. • Analyses of properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws. • The results of basic research are usually published in peer-reviewed scientific journals.	

Applied Research

	Percentage
• Original investigation to acquire new knowledge with a specific application in view. • Activities that determine the possible uses for the findings of basic research. • The results of applied research are intended primarily to be valid for a single or limited number of products, operations, methods or systems. • Applied research develops ideas into operational form and may be published in peer-reviewed journals or subjected to other forms of intellectual property protection.	

Experimental Development

	Percentage
• Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed.	

TOTAL	**1**	**0**	**0**

13a. Multi-Disciplinary R&D (2010/2011)

Please estimate the percentage of R&D expenditure allocated to the following areas:

• Multi-disciplinary R&D combines several research fields or disciplines. If your organisation performs such R&D, as described below, please provide the applicable percentage of total R&D Expenditure.
• Note that the percentages will most likely not total 100%.
Example: The development of a malaria vaccine could involve the fields and/or disciplines of ethno-botany & pharmacology, and economics & law.

Multidisciplinary Area of R&D (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

No Multi-Disciplinary R&D	☐	← TICK if no such R&D is done

13b. R&D in National Development Priorities (2010/2011)

Please estimate the percentage of R&D expenditure allocated to the national development priorities, e.g. addressing the Millennium Development Goals (MDGs), Agricultural Modernisation, Industrialisation & Private Sector Competitiveness, Poverty Eradication & Wealth Creation:

Priority Areas of Interest (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

PART 5: R&D OUTSOURCED AND/OR CONTRACTED OUT IN 2010/2011

Outsourced R&D refers to:
• Outsourced or extramural expenditures being the amounts a reporting unit paid or committed to pay to another organisation for the performance of R&D during a specific period.
• This includes acquisition of R&D performed by and/or grants given to other organisations for performing R&D

	Ushs. (excluding all taxes)
14. State value of R&D outsourced **inside** UGANDA	

	Ushs. (excluding all taxes)
15. State value of R&D outsourced **outside** UGANDA	

16. If the amount stated in **question 14 or 15** is in excess of **100 million Uganda Shillings**, please indicate the name of the organisation(s) that conducted the outsourced R&D with the associated expenditure.

State details of R&D outsourced **inside** UGANDA.

Outsourced to:	Approximate Value Ushs. (excluding all taxes)
1.	
2.	
3.	
4.	
5.	

State details of R&D outsourced **outside UGANDA**

Outsourced to:	Approximate Value Ushs. (excluding all taxes)
1.	
2.	
3.	
4.	
5.	

PART 6: COLLABORATIVE R&D IN 2010/2011

17a. With whom is R&D conducted in partnerships, alliances or collaboration?

A single project may be undertaken in collaboration with several national and/or foreign partners.

Organizations with which you have collaborated with	Number of R&D projects	
	NATIONAL PARTNERS	FOREIGN PARTNERS
Higher Education Institutions		
Science Councils		
Government Research Institutes		
Private sector (domestic only)		
Other Companies		
Not-for-profit organisations		
Foreign Organisations		
TOTALS		
NO COLLABORATION (please tick)	☐	☐

17b. Please state the areas (R&D projects) of collaboration

NATIONAL PARTNERS	FOREIGN PARTNERS

PART 7: RESEARCH OUTPUTS IN 2010/2011

18a. Did your organisation/department apply for Intellectual Property Rights during the period 1 July 2010 to 30 June 2011?

1. Yes ..... ☐ If yes, proceed to **18b**.
2. No ..... ☐

18b. Please state the number of IP rights applied for and granted to your institution /firm (if any) in 2010/2011 within in the appropriate boxes

	Type of IP Right	IP Rights Applied for	IP Rights Granted
a.	Utility models		
b.	Industrial designs		
c.	Integrated circuits		
d.	Trademarks		
e.	Patents		
f.	Copyrights		
g.	Service marks		

19. Have you published scientific papers in local or international journals for the last five (5) years?

Yes ☐ No ☐

If yes, please indicate scientific paper and international publications:

Title of Scientific Paper/Publication	Type of Journal / Year of Publication			
	Local	Year	International	Year

Comments from the Respondent

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Signature..... **Date:** .....

THANK YOU FOR YOUR COOPERATION

Appendix 4: Private Non-Profit R&D Survey

UNCST Clearance

U	N	C	S	T	-	2	0	1	2	-	0	4

RESEARCH & DEVELOPMENT SURVEY (R&D) 2012

PRIVATE NON-PROFIT QUESTIONNAIRE

Reference Period: 2010

The Uganda National Council for Science and Technology (UNCST) is responsible for the development and implementation of policies and strategies for integrating Science and Technology into the national development process

Please help us measure the level of Research and Development (R&D) in the Private Non-profit Sector

April 2012

Research and Development Survey (R&D), 2012

A. Background

1. ***Introduction***

The Uganda National Council for Science and Technology (UNCST) is conducting a comprehensive Research & Development Survey in Uganda following the pilot survey undertaken in 2009. The survey will collect data on the status and levels of Research and Development in the Private Non-profit sector for the period 2010.

2. ***What is the Legal Mandate to collect this data?***

The UNCST is empowered to collect this data by the **UNCST Statute CAP 209** of the Laws of Uganda. The information provided by your entity will be treated with strict **confidentiality** in line with the Uganda Bureau of Statistics (UBOS) Act of 1998 and will be used only in aggregated statistical format for analysis and policy formulation purposes.

The interviewers and staff involved in the R&D survey are under oath of secrecy not to disclose any entity-specific information to a third party individual/entity. The data/information collected will only be published in aggregate form.

3. ***Why do we need to collect this information?***

The information is a key input in the compilation of the Gross Domestic Expenditure on Research and Development (GERD) – the sum of R&D expenditures in the following four economic sectors: business, government, higher education, and private non-profit. The GERD measures R&D on a national scale in order to guide the formulation, implementation and review of Science, Technology and Innovation (STI) policies.

4. ***How do you benefit?***

The R&D surveys are a rich source of information that facilitates effective planning and policy formulation with respect to Science, Technology and Innovation, which benefits both the public and private sectors. The surveys generate data that enable the design and implementation of interventions that specifically address national, sectoral and local needs.

B. Guidelines

1. ***Who needs to complete this questionnaire?***

The Chief Executive Officer or a suitable representative of the targeted entity shall fill the questionnaire.

2. ***Which parts of the questionnaire do I have to fill?***

Please complete all sections of the questionnaire that relate to your entity.

3. ***Do you need assistance?***

Our interviewers are available for guidance on how to complete this questionnaire. In addition, the following personnel may be contacted for any further inquiries or clarifications:

Contact persons	Telephone/Fax	E-mail/Website
Patrick Mafabi	T. +256 414 705 531 M. +256 782 286 451	p.mafabi@uncst.go.ug
Noeline Basiime	T. +256 414 705 531 M. +256 752 453030	n.basiime@uncst.go.ug

4. ***What do I do after completing the questionnaire?***

The duly filled questionnaire will be collected by the interviewer or can be returned to the office of the Executive Secretary, Uganda National Council for Science and Technology: Plot 6, Kimera Road, Ntinda, Science and Technology House, P. O. Box 6884 Kampala, Tel: +256 414 705 531, Fax: +256 414 234 579 before or within **fourteen (14) days** from the date of delivery. Respondents submitting the questionnaire electronically should send completed returns to email: **info@uncst.go.ug**

6. ***Will there be any feedback?***

Yes! As a way of promoting dialogue we will share with you the results of this survey in aggregate form and seek your further involvement in this exercise. Aggregated results will also be posted on the following website: *http://www.uncst.go.ug*.

THANK YOU FOR YOUR CONTINUED COOPERATION

C. Definitions

What is Research & Development?

This survey follows the approach of the Organisation for Economic Co-operation and Development (OECD) as adopted in 2007 during the first meeting of the African Inter-governmental Committee on Science, Technology and Innovation Indicators in Maputo (Mozambique). It defines Research and Experimental Development (R&D) as:

- Research is creative work and original investigation undertaken on a systematic basis to gain new knowledge, including knowledge of humanity, culture and society.
- Development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products, services or processes.

The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned.

What does R&D include?

Activities of personnel who are obviously engaged in R&D. In addition include:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D
- Management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support to those performing R&D
- Software development where the aim of the project is the systematic resolution of a scientific or technological uncertainty
- Research work in the biological, physical and social sciences, and the humanities
- Social science research including economic, cultural, educational, psychological and sociological research
- Research work in engineering and the medical sciences
- R&D projects performed for other parties
- "Feedback R&D" directed at solving problems occurring beyond the original R&D phase, for example technical problems arising during initial production runs.

What does R&D Exclude?

The following ROUTINE activities are excluded , except where they are an essential part of in-house R&D activity:

- Scientific and technical information services
- Engineering and technical services
- General purpose or routine data collection
- Standardisation and routine testing
- Feasibility studies (except into R&D projects)
- Specialised routine medical care, for example routine pathology services
- The commercial, legal and administrative aspects of patenting, copyrighting or licensing activities
- Routine computer programming, systems work or software maintenance where there are no technological uncertainties to be resolved.

Fields of Science and Technology Classification	
1. Natural Sciences • Mathematics and computer sciences • Physical sciences • Chemical sciences • Earth and related environmental sciences • Biological sciences **2. Engineering and Technology** • Civil engineering • Electrical engineering, electronics • Other engineering sciences **3. Medical and Health Sciences** • Basic medicine • Clinical medicine • Health sciences	**4. Agricultural Sciences** • Agriculture, forestry, fisheries and allied sciences • Veterinary medicine **5. Social Sciences** • Psychology • Economics • Educational sciences • Other social sciences **6. Humanities** • History • Languages and literature • Other humanities

PART 1: GENERAL INFORMATION

1a. What is the Registered name of the Organisation?

1b. Which Year did the Organisation start operating in Uganda?

1c. Are you part of a Larger Group/Organisation?

Yes	No

1d. What is the Name of the Parent Organisation (if applicable)?

1e. What is the Parent Organisation's Country of Origin?

1f. If you are reporting R&D for an umbrella organisation (e.g. as a head office with several subsidiary organisations), please list the organisations below (append a page if required).

1.	
2.	
3.	
4.	
5.	

2. What is the principal Activity of your Organisation?

2a. What is the principal Activity of your Organisation?	ISIC CODE (Official use only) 1

2b. What are the other (secondary) activities of your Organisation? (if necessary, please continue on separate sheets)

	ISIC CODE
	2
	3
	4
	5

3. List your main products and/or services in their order of importance:
(if necessary, please continue on separate sheets)

	Product/Service	% of Importance	CPC Code (Official use only)
P01			
P02			
P03			
P04			
P05			

4. Give the total number of employees, (*including staff on contract for six months or longer*), on the last payday in:

	Dec 2009			Dec 2010			Dec 2011		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	M	F	T	M	F	T	M	F	T
Full-time employees									
Part-time employees									
Support staff									
Total Employees									

5. Gross Annual Income (*Uganda Shillings excl. all taxes*)

2009	2010	2011

6. International purchases and sales of technology and technological 'know-how'

International flows (purchases / sales) of technology and technical know-how?
This question measures international flows of industrial property and know-how.

Please **include** purchases or sales on the following operations: patents; licences for patents; know-how (not patented); models and designs; trademarks (including technology franchising); technical services; finance of industrial R&D outside national territory.

Please **exclude** purchases or sales on the following operations: commercial, financial, managerial and legal assistance; advertising; insurance; transport; films, recordings, material covered by copyright; design; software.

Ushs. (excluding all taxes)

6a. Purchases of technology and know-how from outside Uganda:

6b. Sales of technology and know-how to outside Uganda:

7. Did the Organisation perform any IN-HOUSE R&D in UGANDA during the year 2010?

- *In-house R&D refers to R&D performed by the reporting unit on its own behalf or on behalf of others.*
- *It excludes R&D projects funded by this organisation but carried out by others using their own facilities.*
- *In-house R&D must be distinguished from outsourced R&D which should be reported under part 5.*
- *Only R&D performed in UGANDA should be recorded.*

Yes ☐ Continue with Question 8 - 18

No ☐ Proceed to Parts 5-7: Questions 13 to 18 on Outsourced R&D, Collaborative R&D and Research Outputs.

☐ If your Organisation does *not* do any In-House and/or any Outsourced R&D, please provide comment on your non-involvement in R&D in the box below.

PART 2: IN-HOUSE R&D PERSONNEL

8. Who among your staff performed/engaged in any R&D activity during the year, 2010?

Please list down ALL personnel connected with your organisation that performed / engaged in any R&D activity at any given time during the period 1st January 2010 to 31st December 2010 including some of their characteristics. Include also personnel who are no longer connected but who were engaged in any R&D activity performed in your institution during the reference period (e.g. resigned/ retired staff, project personnel)

LINE NUMBER	NAME OF PERSONNEL	GENDER M-Male F-Female	AGE 1 -25 2 25-30 3 31-34 4 35-40 5 41-44 6 45-50 7 51-54 8 55-60 9 61-64 10 65-70 11 71-74 12 >75	HIGHEST EDUCATIONAL ATTAINMENT	
				Enter code	Specify course / area of specialisation at highest level
(1)	(2)	(3)	(4)	(5)	(6)
Ex	Mafabi Patrick	M	11	2	Civil Engineering
01					
02					
03					
04					
04					
05					
06					
07					
08					
09					
10					
11					
12					

CODES FOR COL (5)-Highest Education Attainment

1. Post-doc, PhD, Doctorate
2. Masters
3. Bachelors
4. Higher Diplomas
5. Ordinary Diplomas, Certificates

Researchers: Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the planning and management of the projects concerned.

Technicians directly supporting R&D: Persons doing technical tasks in support of R&D, normally under the direction and supervision of a Researcher.

Other personnel directly supporting R&D: Other supporting staff includes skilled and unskilled crafts persons, secretarial and clerical staff participating in R&D projects or directly associated with such Projects.

NOTE: Do not include personnel indirectly supporting R&D: Typical examples are transportation, storage, cleaning, repair, maintenance and security activities, as well as administration and clerical activities undertaken not exclusively for R&D (such as the activities of central finance and personnel departments).Allowance for these should be made under overheads in R&D expenditure (current expenditure – Question 7H) but such persons should not be included as R&D Personnel.

Please provide corresponding information for each person engaged in ANY R&D regardless of the number of projects engaged in during the period 1st January 2010 to 31st December 2010: Only one entry per individual

LINE NUMBER	FIELD OF SCIENCE AND TECHNOLOGY/ CURRENT AREA OF R&D WORK (FIELD OF RESEARCH)		CATEGORY OF R&D PERSONNEL (ENTER CODE)	STATUS OF APPOINTMENT WITH INSTITUTION WHILE DOING R&D (ENTER CODE)	NUMBER OF MONTHS ENGAGED IN R&D DURING THE REFERENCE PERIOD	AVERAGE NUMBER OF HOURS PER WEEK SPENT ON R&D
	ENTER CODE	SPECIFY**				
(7)	(8)	(9)	(10)	(11)	(12)	(13)
Ex	2	Materials Sciences	1	2	12	35
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						

CODES FOR COL (8) - Field of S&T

1. Natural Sciences
2. Engineering and Technology
3. Agricultural Sciences
4. Medical sciences
5. Social Sciences
6. Humanities

CODES FOR COL (10) - Category of R&D Personnel

1. Researcher
2. Technician
3. Support Staff

CODES FOR COL (11) - Status of appointment

1. Permanent
2. Contractual
3. Temporary

Refers to the specific area of research under the identified field of S&T (see page 6).

PART 3: IN-HOUSE R&D EXPENDITURE IN 2010

9. Allocate In-House R&D Expenditure as Follows

CAPITAL EXPENDITURE ON R&D (2010)

- The full value of capital expenditure must be reported in the year of purchase (do not depreciate).
- If the asset has been/will be used for more than one activity, **include an estimate of the portion used for R&D**.

Including - but not limited to:	*Excluding:*
• Expenditure on fixed assets used in the R&D projects of your business. • Acquisition of software for R&D, including fees, expected to be used for more than one year. • Purchase of databases expected to be used for more than one year. • Major repairs and improvements on land and buildings used for R&D.	• Other repairs and maintenance expenses. • Depreciation provisions. • Proceeds from the sale of R&D assets.

		Ushs. (excluding all taxes)
Land and buildings	**A**	
Plant and machinery	**B**	
Vehicles	**C**	
Computers and related equipment	**D**	
Other office equipment	**E**	
Work in progress for capital assets	**F**	

LABOUR COSTS OF R&D PERSONNEL (2010)

		Ushs. (excluding all taxes)
Labour Costs of R&D personnel (To match Question 8)	**G**	

OTHER CURRENT EXPENDITURE ON R&D (2010)

Including - but not limited to:	*Excluding:*
• Materials, fuels and other inputs (including all running costs). • Water, electricity and other overhead expenses. • Repair and maintenance expenses. • Payments to outside organisations for use of specialised testing facilities. • Payments to outside organisations for analytical work, engineering or other specialised services in support of R&D projects carried out by this department/unit. • Commission/consultant expenses for research projects carried out by this department/unit. • Other R&D expenses and indirect costs not classified in 9A to 9G. • The relevant % of labour costs of persons providing indirect services such as Head Office, HR, Finance, Security,	• R&D activities where the research project is carried out elsewhere by others on behalf of your business. • Payments for purchases of technical know-how. • Payments for patent searches. • Depreciation provisions.

Maintenance Personnel, Staff of Central Libraries, IT Departments.		

		Ushs. (excluding all taxes)
Other Current Expenditure **(utilities, transport, communication, staff training, rent, and maintenance)**	**H**	

		Ushs. (excluding all taxes)
TOTAL R&D EXPENDITURE (A + B + C + D + E + F + G + H) = I	**I**	

10. Sources of Funds in In-House R&D (2010)

Provide a breakdown of the total R&D expenditure (as reported in question 9) according to sources of funds.

Organisation	Ushs. (excluding all taxes)
Own funds - refer to Organisation's own budget (own generated funds)	
Government - refer to funds provided by government Ministries, Departments or Agencies	
Business (Domestic only) - refer to funds provided by local business sector	
Private Funds - refer to funds provided by private non-profit institutions and individual donations	
Foreign Funds - refer to funds provided by parent company, foundations and other foreign sources	
Other Sources (please specify)	
	Ushs. (excluding all taxes)
TOTAL R&D EXPENDITURE	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE IN 2010

11. In-House R&D Current Expenditure by Type of R&D (2010)

Specify the percentage of total IN-HOUSE CURRENT R&D expenditure by type of R&D.

Basic Research

	Percentage
• Work undertaken primarily to extend the boundaries of disciplinary knowledge with no particular application in view. • Analyses of properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws. • The results of basic research are usually published in peer-reviewed scientific journals.	

Applied Research

	Percentage
• Original investigation to acquire new knowledge with a specific application in view. • Activities that determine the possible uses for the findings of basic research. • The results of applied research are intended primarily to be valid for a single or limited number of products, operations, methods or systems. • Applied research develops ideas into operational form and may be published in peer-reviewed journals or subjected to other forms of intellectual property protection.	

Experimental Development

	Percentage
• Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed.	

TOTAL	1	0	0

12a. Multi-Disciplinary R&D (2010)

Please estimate the percentage of R&D expenditure allocated to the following areas:

- Multi-disciplinary R&D combines several research fields or disciplines. If your organisation performs such R&D, as described below, please provide the applicable percentage of total R&D Expenditure.
- Note that the percentages will most likely not total 100%.

Example: The development of a malaria vaccine could involve the fields and/or disciplines of ethno-botany & pharmacology, and economics & law.

Multidisciplinary Area of R&D (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

No Multi-Disciplinary R&D	☐	← TICK if no such R&D is done

12b. R&D in National Development Priorities (2010)

Please estimate the percentage of R&D expenditure allocated to the national development priorities, e.g. addressing the Millennium Development Goals (MDGs), Agricultural Modernisation, Industrialisation & Private Sector Competitiveness, Poverty Eradication & Wealth Creation:

Priority Areas of Interest (please specify)	Percentage of R&D expenditure
1.	
2.	
3.	
4.	
5.	

PART 5: R&D OUTSOURCED AND/OR CONTRACTED OUT IN 2010

Outsourced R&D refers to:
- Outsourced or extramural expenditures being the amounts a reporting unit paid or committed to pay to another organisation for the performance of R&D during a specific period.
- This includes acquisition of R&D performed by and/or grants given to other organisations for performing R&D

	Ushs. (excluding all taxes)
13. State value of R&D outsourced **inside** UGANDA	

	Ushs. (excluding all taxes)
14. State value of R&D outsourced **outside** UGANDA	

15. If the amount stated in **question 13 or 14** is in excess of **100 million Uganda Shillings**, please indicate the name of the organisation(s) that conducted the outsourced R&D with the associated expenditure.

State details of R&D outsourced **inside UGANDA.**

Outsourced to:	Approximate Value Ushs. (excluding all taxes)
1.	
2.	
3.	
4.	
5.	

State details of R&D outsourced **outside UGANDA**

Outsourced to:	Approximate Value Ushs. (excluding all taxes)
1.	
2.	
3.	
4.	
5.	

PART 6: COLLABORATIVE R&D IN 2010

16a. With whom is R&D conducted in partnerships, alliances or collaboration?

A single project may be undertaken in collaboration with several national and/or foreign partners.

Organizations with which you have collaborated with	Number of R&D projects	
	NATIONAL PARTNERS	FOREIGN PARTNERS
Higher Education Institutions		
Science Councils		
Government Research Institutes		
Private sector (domestic only)		
Other Companies		
Not-for-profit organisations		
Foreign Organisations		
TOTALS		
NO COLLABORATION (please tick)	☐	☐

16b. Please state the areas (R&D projects) of collaboration

NATIONAL PARTNERS	FOREIGN PARTNERS

PART 7: RESEARCH OUTPUTS IN 2010

17a. Did your organisation apply for Intellectual Property Rights during the period 1 January 2010 to 31 December 2010?

1. Yes ..... ☐ If yes, proceed to **17b**.

2. No ..... ☐

17b. Please state the number of IP rights applied for and granted to your institution /firm (if any) in 2010 within in the appropriate boxes

	Type of IP Right	IP Rights Applied for	IP Rights Granted
a.	Utility models		
b.	Industrial designs		
c.	Integrated circuits		
d.	Trademarks		
e.	Patents		
f.	Copyrights		
g.	Service marks		

18. Have you published scientific papers in local or international journals for the last five (5) years?

Yes ☐ No ☐

If yes, please indicate scientific paper and international publications:

Title of Scientific Paper/Publication	Type of Journal / Year of Publication			
	Local	Year	International	Year

Comments from the Respondent

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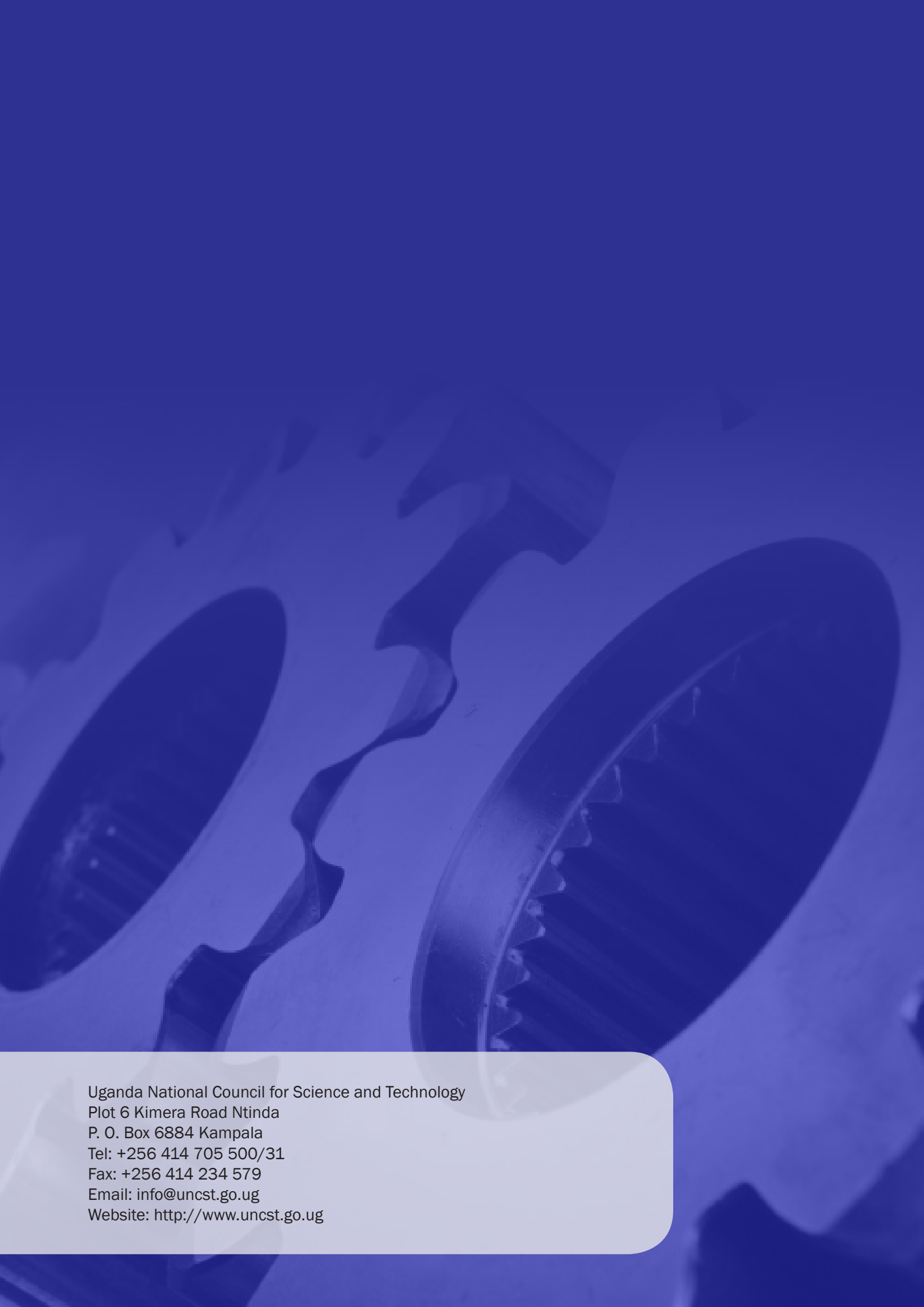
Signature..... **Date:** .....

THANK YOU FOR YOUR COOPERATION



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