



SCIENCE GRANTING COUNCILS INITIATIVE IN SUB-SAHARAN AFRICA STRENGTHENING PARTNERSHIPS AMONG AFRICA'S SCIENCE GRANTING COUNCILS AND THE PRIVATE SECTOR

A BASELINE ASSESSMENT OF PUBLIC – PRIVATE PARTNERSHIPS IN RESEARCH AND SCIENTIFIC
COOPERATION IN UGANDA

By:

Winnie Khaemba

African Centre for Technology Studies (ACTS)

February, 2018



Contents

Executive summary	3
1. Introduction	4
2. Methodology.....	4
3. State of collaborations in Uganda.....	4
3.1 State of PPP collaborations	5
3.2 State of collaboration with other SGCs.....	8
4. Factors constraining and enabling collaboration and knowledge transfer between SGCs	11
4.1 SGC related policy frameworks.....	11
4.2 SGC capacities and capabilities	12
4.3 External policy and legal frameworks	12
5. Factors constraining and enabling collaboration and knowledge transfer with the private sector...	12
5.1 SGC related policy frameworks.....	12
6. Recommendations for SGCs	13
References	13

Executive summary

The Uganda National Council for Science and Technology (UNCST), which was established in 1990 by an Act of Parliament, spearheads STI activities in Uganda. It is charged with developing and incorporating science and technology in the national development process. The UNCST advises government on relevant policy matters and coordinates research and development activities in Uganda. There exists an STI Policy as well as a National Science, Technology and Innovation Plan (NSTP) that seeks to achieve the objectives of the UNCST.

STI activities in Uganda are largely public-sector driven with public research institutes such as Uganda Industrial Research Institute (UIRI), the National Agricultural Research Organisation (NARO), Uganda National Health Research Organisation (UNHRO) and the National Forestry Authority (NFA) among others and public universities such as Makerere with greater focus on basic research than applied research and product development.

Driven by its mandate, the UNCST has forged a number of collaborations with other Science Granting Councils (SGCs) in Africa and beyond as well as with the private sector. Currently, the UNCST is collaborating with eleven (11) Science Granting Councils (SGCs) in Africa and engaged in thirteen (13) collaborative projects that involve the private sector. UNCST reports point to success and gains with such collaborations thus it intends to foster more partnerships both locally and internationally.

Lack of proper coordination among the different STI players, inadequate funding and infrastructure as well as policy deficiency are some of the constraints inhibiting collaboration with private sector and other SGCs. There are also a number of enabling factors including the linking of STI to Uganda's development outlined in its economic blueprint *Vision 2040*, UNCST funding for projects that include private sector, increasing recognition of the role of STI as well as an increasing number of players in Uganda's STI sector.

Some recommendations from this study include a finalization of the IP policy to provide guidance on IP issues in the STI sector, enhanced collaboration with other similarly mandated research agencies to find synergies and create coherence for stronger collaboration with private sector and other SGCs.

1. Introduction

Uganda, located in East Africa, has made progressive steps in developing science, technology and innovation. This has been achieved through enacting laws and policies, setting up institutions on STI, funding research in Uganda and fostering collaboration with both public and private sector players locally and internationally. This baseline study, looking at the state of collaborations engaged in by the UNCST is conducted under Theme 3 of the Science Granting Councils Initiative (SGCI) on strengthening the capacity of Science Granting Councils (SGCs) to promote scientific cooperation with each other and with other science system actors, and to foster public-private research collaboration and exchange of knowledge. The [SGCI](#) seeks to strengthen capacities of SGCs in order to support research and evidence-based policies that will contribute to economic and social development.

The objectives of this study are to:

- i. Examine factors that constrain/facilitate public-private partnerships (PPPs) and international cooperation and collaboration among Councils.
- ii. Identify capacity and skill set gaps among the Councils in terms of designing, regulating, managing and providing quality assurance to PPP and cooperation projects.
- iii. Examine the legal, legislative, policy and institutional frameworks that underpin PPP and cooperation projects.

In the context of this baseline study PPP refers to a publicly-funded research collaboration among research and higher education organizations, such as universities, public funding agencies, such as SGCs and industry or private sector actors within a particular national context. On the other hand international collaborations of an SGC refers to a research partnership agreement that an SGC under study has formally established or started negotiations with other SGCs or international actors at the time of this study.

2. Methodology

This baseline study has been undertaken via a desktop study as one of four 'light studies' undertaken under Theme 3. This report is expected to inform the current status and assist Uganda to increase its collaboration and progress towards meeting its STI targets through providing a benchmark document.

3. State of collaborations in Uganda

The Uganda National Council for Science and Technology (UNCST) was established by the Uganda National Council for Science and Technology Act of 1990 CAP 209 with the primary mandate of developing and implementing ways of incorporating science and technology in the national development process. The UNCST advises government on relevant policy matters and coordinates research and development activities in Uganda¹.

The NCST has four strategic goals, which are to:

¹ Uganda National Council for Science and Technology Act of 1990 CAP 209

1. Improve or streamline national science and technology policy environment to foster scientific and technological innovation.
2. Strengthen the national system for research, product development, technology transfer and intellectual property management.
3. Increase public understanding and appreciation of science and technology.
4. Strengthen the UNCST institutional research base and technical capacity.

The UNCST is mandated to cooperate and coordinate activities on science and technology undertaken by individuals, organizations and institutions.

The table below shows a summary of the Research and development landscape in Uganda².

Table 1: Summary of the Research and development landscape in Uganda.

Gross expenditures on R&D (GERD) Million National Currency	Total	Business sector	Government	Higher Education	Private non- profit organizations
GERD by Sector and source of funds	194769.3	67722.0	75138.9	49482.0	2426.4
Business Enterprise	26632.8	25652.0	5.4	818.4	157.0
Direct Government	29194.5	233.0	23609.9	5338.5	13.1
General University Funds	13530.4			13530.4	
Higher Education	2019.5	397.0	1066.9	445.9	109.7
Private non-profit organizations	11780.6	8340.0	765.2	1357.9	1317.5
Funds from abroad	111611.5	33100.0	49691.5	27990.9	829.1
GERD by sector and type of costs	194766.4	67719.0	75138.9	49482.0	2426.5
Labour costs	45997.1	19600.0	16526.2	8593.4	1277.5
Other current costs	89343.7	29200.0	36940.5	22529.6	673.6
Land and Buildings	14950.3	2050.0	10687.2	2213.1	
Other capital costs	44475.3	16869.0	10985.0	16145.9	475.4
Total intramural expenditure by type of R&D	194769.2	67722.0	75138.8	49481.9	2426.5
Basic research	67586.8	29254.2	20931.5	16469.3	931.8
Applied research	83721.6	22630.1	34885.9	25518.9	686.7
Experimental development	43460.8	15837.7	19321.4	7493.7	808.0
Not elsewhere classified	0.0				
Expenditure on R&D by field of science	194769.2	67722.0	75138.8	49481.9	2426.5
Natural sciences	17518.4	11614.9	177.2	5707.9	18.4
Engineering and Technology	23733.3	16220.8	1286.7	6225.6	0.2
Medicine and Health	35335.4	0.0	16803.8	17591.1	940.5
Agricultural sciences	32619.7	1221.6	26089.8	5298.4	9.9
Social sciences	58067.9	38048.9	13440.2	5600.1	978.7
Humanities	27494.5	615.8	17341.1	9058.8	478.8
Other	0.0				

Source: National R&D and Innovations Survey 2012

3.1 State of PPP collaborations

Given its mandate, the UNCST has pursued a number of collaborations to fulfill its mandate including with private sector. The table below highlights some of these collaborations. It should be noted that

² National R&D and Innovations Survey 2012. Figures in Uganda Shillings

there are various other collaborations that exist, some informally, between private sector and other public research organizations in Uganda with an almost similar mandate as the UNCST.

Table 2: Recent PPP collaborations in Uganda.

	Project Name	Partner	Year(s)	Theme	Outputs	Notes
1	Fresh Vacuum Sealed Matooke	Kyambogo University Afribanana (U) Ltd Unibrain	2017	Agro-processing (banana Value Addition)	Fresh vacuum sealed matooke Banana Juice Banana Wine Banana Vinegar Biogas	Project currently ongoing
2	Evaluating the utility of sericulture technologies, silk based textiles as tools for household wealth creation and employment generation in Uganda	Tropical Institute for Development Innovations Sheema District Local Government	2017	Agro-processing (Silk Value chain Development)	Silk yarn and fabric	
3	Using Exclusive-Based Sample Preparation (ESP) and Generic Reagents to Reduce HIV Viral Load Assay Cost	Joint Clinical Research Centre (JCRC) University of Wisconsin, USA Salus Discovery LLC, USA	2015	Medical Diagnostics Development and Testing	Rapid and cheap Viral Load count Test Kit	
4	Industrial production and Commercialization of banana Juice	Forest Fruit Foods Ltd	2017	Agro-processing	Banana Juice	
5	Production of Low Cost Solar Irrigation Water Pumps	Makerere University Uganda Industrial research Institute Uganda Gatsby Trust	2017	Manufacturing	Low Cost Solar Irrigation Water Pumps	
6	Production of tropical Fruits Wines for improved rural household incomes and reduced post-harvest losses of fruits	Maritas Food Limited Busitema University	2017	Agro-processing	Tropical Fruit Wines	
7	Stre@mline:	Church of Uganda	2015	Software	Integrated	

	Integrating patient safety and efficient health service delivery using Information Technology	Kisiizi Hospital Rugarama Hospital, kabale Rimpscom Company Limited		Development and Application	Hospital Management Software	
8	Malaria prevention at household level using Artemisia annua-avocado seed powder-lemon grass blend beverage	Heritage (U) Limited Natural Chemotherapeutics Research Institute Mbarara University of Science and Technology	2017	Drug Development	Anti-malarial Beverage (drug)	
9	Developing a registry of group A Streptococcus in Uganda (AFROSTREP)	Uganda Heart Institute University of Cape Town	2017	Cardiovascular medicine	A registry of group A Streptococcus in Uganda	
10	The use of ICT in teaching science in High schools in South Africa and Uganda	Makerere University Univeristy of Limpopo	2017	STEM Education	Virtual laboratories	
11	An assessment of the implications of land use and cover change for food security, and climate variability in forest and semi-arid ecosystems of South Africa and Uganda	Makerere University Nelson Mandela Metropolitan University	2017	Climate Change Science	Report	
12	Feasibility and potential effect of point-of-care Xpert MTB/RIF Ultra and Xpert HIV-1 viral load testing in HIV-positive patients using the polyvalent GeneXpert Omni platform: a two-phase multi-site study	Makerere University Stellenbosch University	2017	Medical Diagnostics Development and Testing	Viral Load Test Kit	
13	A hybrid thermal energy storage	Makerere University North West	2017		Indirect solar cooker	

suitable for high temperature solar concentrating energy systems for household cooking applications	University, Mafikeng Campus				
---	-----------------------------	--	--	--	--

3.2 State of collaboration with other SGCs

Uganda has signed collaborative agreements with a number of countries and regional and international organizations (see Table 3 for some of these agreements). The collaboration is guided by the NCST's mandate to promote collaboration on research and development both locally and internationally.

Table 3: State of Ugandan collaboration with other SGCs

	Country	Collaborating Institution	Year (s)	Theme (S)	Output (s)	Amount	Notes
	South Africa	National Research Foundation	2007	Research Collaboration	Co-funded research projects		
	Kenya	National Commission for Science and Technology/ East African Commission for Science and Technology	2014	Research, Science and Technology	Joint projects		
	Tanzania,	National Commission for Science and Technology/ East African Commission for Science and Technology	2014	Research, Science and Technology	Joint projects		
	Rwanda	National Commission for Science and Technology/ East African Commission for Science and Technology	2014	Research, Science and Technology	Joint projects		
	Burundi	National Commission for Science and Technology/ East African Commission for Science and	2014	Research, Science and Technology	Joint projects		

		Technology					
	Namibia	National Commission for Research, Science and Technology	2015	Research, Science and Technology	Joint projects		
	Zambia	National Commission for Science and Technology	2017	Research, Science and Technology	Joint projects		
	Ivory Coast	National Commission for Research and Development	2017	Research and Development	Joint projects		
	Ghana	Council for Scientific and Industrial Research (CSIR) - Science and Technology Policy Research Institute (STEPRI)	2008	Research and Development; STI policy studies	Joint activities		
	Senegal	Africa Regional Centre for Technology	2005	Research and Development and Technology Transfer	Joint activities		
	USA	National Institutes of Health (NIH)	2016	Training biomedical scientists and product development	Product development	41 million	
	South Africa	National Research Foundation (NRF) of South Africa	2016	Renewable energy, Biotechnology (Health and Agriculture), and ICT (Education)			
	UNFCCC	Climate Technology Centre and Network (CTCN ³)	2016	Strategy for a national pay-as-you-go policy and mechanisms to enhance rural off-grid solar energy access and clean cookstoves	A strategy	\$100-150k	Aligned with SDG 5 (gender equality), 7 (affordable and clean energy), 10 (reduced inequalities) and 13 (climate action)

³ CTCN is a UNFCCC Technology Mechanism organ that facilitates transfer of environmentally sound technologies for low-carbon and climate resilient development.

	UNFCCC	CTCN		Climate resilient decision making methods for Lake Victoria		\$200-250k	Request made by the Lake Victoria Basin Commission through the UNCST and implemented by UNEP-DHI Partnership – Centre on Water & Environment. Aligned with SDG 8 (Decent work and economic growth) and SDG 13 (climate action) and Uganda’s Climate commitments under the Paris Agreement
	UNFCCC	CTCN		Formulating Geothermal Energy Policy, Legal and Regulatory Framework	Geothermal Energy Policy	\$200-250k	Requested by the Ministry of Energy and Mineral Development through the UNCST. Aligned with SDG 7 (affordable and clean energy), SDG 8 (Decent work and economic growth) and 13 (climate action).

4. Factors constraining and enabling collaboration and knowledge transfer between SGCs

Enabling factors for collaboration include Uganda's Vision 2040, which recognizes the role of STI in achieving its objectives. There is also the National Council for Science and Technology (NCST) Act, which mandates the NCST to seek partnerships and collaborate.

According to the UNCST's National Science and Technology Policy (NSTP) the following are some of the constraints:

Lack of proper coordination among the different players charged with STI in Uganda for example public agencies meant to be coordinated by UNCST themselves fall under other ministries making it difficult for UNCST to play this role since it is also located within a ministry.

Inadequate resources to enable NCST successfully deliver on its own objectives let alone set aside funds for collaborative initiatives

Inadequate infrastructure where less than 10 universities in Uganda offer STI research courses, which in turn means that there is inadequate personnel and capacity in the STI sector.

Poor understanding of the role of STI in Uganda's development thus little interest in pursuing collaboration with others even though there has been an increase in interest on STI issues.

4.1 SGC related policy frameworks

STI in Uganda is guided by the 1990 UNCST Act as an overarching framework for the country. A number of policy documents, plan, strategies, reviews etc have resulted from and been led by the UNCST including an STI policy and periodic STI plans.

In 2009, Uganda developed the STI policy recognizing the sector as key to its development. The policy defines the vision of the STI sector and provides pathways for achieving this vision.⁴

Uganda also has a National Science, Technology and Innovation Plan (NSTP) 2012/2013 - 2017/2018 which was completed in 2012⁵, over 20 years since the UNCST's establishment. The NSTP sets out to 'i) create an enabling policy environment to foster STI ii) build the STI sector capacity to generate and transfer technology, iii) establish and strengthen the legal and regulatory framework to ensure ethics and safety in STI development and application, and iv) strengthen the STI coordination framework to enhance the sector's performance and contribution to national development'. The NSTP explicitly states that Uganda will seek and promote R and D collaboration locally and internationally.

Notably the NSTP adopts THICK analytical framework (Technology, Human Resources, Institutions and Infrastructure, Collaboration and Communication and Knowledge base as having a linear double causality relationship)⁶ for its sector appraisal.

⁴ Uganda STI Policy

⁵ National Science, Technology And Innovation Plan 2012/2013 - 2017/2018

⁶ World Bank (2011)

IP Law in Uganda is still developing with an IP Support Office being established at the UNCST as provided by the Act. Currently IP registration takes place at the Uganda Registration Services Bureau (URSB) and regionally at the Africa Regional Intellectual Property Organization (ARIPO). It is guided by the Industrial Property Act of 2014, Trademarks Act of 2010, and the Trade Secrets Protection Act of 2009 among others. Uganda has set out to incorporate IP studies in its curriculum as well as develop policy and strengthen IP institutions (NSTP 2012).

4.2 SGC capacities and capabilities

The UNCST is currently staffed with technical and administrative staff that helps it deliver on this mandate. Staff are however few and the UNCST are looking to employ more staff as they undertake more activities. In its 2012/13 – 2017/18 STI plan Uganda states that lack of human capacity is a challenge both in terms of numbers and skills. The plan highlights the fact that less than 10 universities offer STI related graduate courses with the numbers of PhDs relatively lower in this field (NSTP 2012).

4.3 External policy and legal frameworks

While Uganda is in the process of developing an IP policy and strengthening its local IP capacity it is party to a number of international IP-related instruments including the Patent Cooperation Treaty of 1995, the WIPO Convention of 1973, the Paris Convention for the Protection of Industrial property, the Convention on Biological Diversity and its protocols, WTO's Trade-related Aspects of Intellectual Property Rights (TRIPS, 1994) and the Africa Regional Intellectual Property Organization (ARIPO) treaty among others.

5. Factors constraining and enabling collaboration and knowledge transfer with the private sector

The NSTP clearly outlines the need for private sector engagement, calling on private sector to invest in STI and work closely with research institutions. This is also clearly outlined in the STI policy and the NCST Act thus forming a strong basis for private sector engagement.

Availability of research funds by the NCST to promote product development as well as other research has attracted private sector to collaborate and tap into these resources.

Constraining factors include the fact that STI is public-institution driven with poor linkages to private sector whereas on the other hand there is little understanding of the role of STI especially in the private sector thus little interest in engaging.

5.1 SGC related policy frameworks

The STI plan envisages working with private sector to meet its four main goals that include:

- i) create an enabling policy environment to foster STI
- ii) build the STI sector capacity to generate and transfer technology,
- iii) establish and strengthen the legal and regulatory framework to ensure ethics and safety in STI development and application, and

- iv) strengthen the STI coordination framework to enhance the sector's performance and contribution to national development'

Strategic actions to achieve these including technology transfer, industrial development through fostering linkages and support for SME's among other strategies; IP management; gender and equity are outlined in the plan.

The National Research and Development Survey 2012 Report points out that there is inadequate capacity in Ugandan institutions to be able to initiate and negotiate collaborative agreements largely because of the lack of an institutional policy guiding such processes. This means that there is need for the UNCST to develop such policies and train its staff in deploying them as they engage private sector.

6. Recommendations for SGCs

There is need for the IP policy in Uganda to be finalized so it provides guidance on IP issues in the STI sector. Additionally, the IP Support office to be strengthened to ensure that the necessary support for IP issue is provided to researchers and other stakeholders.

There is need to foster greater cooperation between different public research entities some of which share a similar mandate to that on the NCST so as to promote synergies and reduce overlaps.

Public-private sector collaboration in Uganda remains low thus need to foster linkages and tap into financial, technological and human resources available across the divide.

References

- The Uganda National Council for Science and Technology Act, 1990
- UNCST (2007) Science and Technology Sector Strategic Plan for Statistics, 2007 – 2012
- UNCST (2011), Policy Options for Sustainable Funding of Uganda's Science, Technology and Innovation System
- UNCST (2012) National R&D and Innovations Survey
- UNCST (2012) National Science, Technology And Innovation Plan 2012/2013 - 2017/2018
- UNCST (2012) Uganda STI Policy
- UNCST (2012), Science, Technology and Innovation Statistical Abstract
- UNCST (2013a), National Innovation Survey 2012 Report
- UNCST (2013b), National Research and Development Survey 2012 Report
- World Bank (2011), Science, Technology and Innovation in Uganda: Recommendations for Policy and Action; A World Bank Study, Washington D.C.