

# The political economy of the Tanzanian science granting council

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## Introduction

Tanzania has evolved since independence through a period of African socialism to a burgeoning economic player in the East African region with an average growth rate of 7%. It has been assisted over time by a series of national development strategies and specifically focused science and technology policies. It has a good tertiary education sector and a large number of research institutes. The majority of research funding comes through the Tanzanian Science Granting Council (SGC) known as the National Fund for the Advancement of Science and Technology or NFAST which is housed within the Commission for Science and Technology (COSTECH) under the ministry in charge of science and technology. As a result the country has a complex policy environment and multiple stakeholders.

This study explores the political and economic factors that influence this context and particularly the work of NFAST and COSTECH in Tanzania to support research activities and the promotion of science, technology and innovation (STI) activity in the country. It is based on the result of a review of grey and published literature on STI and research activities in Tanzania as well as nine key informant interviews (see Table 1). The study was conducted between January and June 2017.

This report has the following sections: Section 1 introduces the Tanzania's STI and research funding field in the context of wider political and economic influences. Section 2 provides an overview of the historical and current situation of STI activities in Tanzania. Section 3 narrows down into the research funding landscape under the SGCs and their predecessors. Section 4 provides details of data from the key informant interviews to highlight emerging themes in the area of economic and political enablers and challenges facing the SGCs. Section 5 concludes with a few recommendations.

**Table 1: Key informant interviews conducted**

<b>Key informant type</b>	<b>Interview medium</b>	<b>Interview date</b>
Science granting council representatives x 2	Face-to-face	8 May 2017
COSTECH employee x 2	Face-to-face	8 May 2017
Private sector representative x 2	Face-to-face	9 May 2017
Education sector representative x 1	Face-to-Face	10 May 2017
Independent research institution representative 1	Phone	12 May 2017
Independent research institution representative 2	Face-to-face	9 May 2017

## 1. Setting the context

The current Five Year Development Plan (FYDP II) for the United Republic of Tanzania states that the country started in 1961 with “only eight qualified Medical Doctors; two Engineers; a life expectancy at birth of only 38 years; a per capita GDP at merely US\$ 48; and no University” (MoFP, 2016a: i). It goes on to say that since then the country has succeeded in creating “a life expectancy of more than 61 years, created a modest pool of 2,190 Medical Doctors and over 30,245 Engineers; established about 50 universities and university colleges and attained a GDP per capita of US\$ 1,043 by 2014; putting the country at the threshold of graduating from Low to Middle Income Country status by 2025” (MoFP, 2016a: i).

These two quotes from the FYDP II provides a good overview of where Tanzania has moved from and now stands with regards its economic and STI situation. During this time it has also had five Heads of State and remained peaceful in comparison to its neighbours. The result has been the development of a well-established bureaucracy.

Science and technology has been on the agenda in Tanzania since the 1960s with the establishment of the National Science Research Council in 1968. It is one of the first countries in the East African region to develop a science and technology policy in 1985. Science, technology and innovation have been addressed in the Development Plans of Tanzania (as the quotes above highlight).

### 1.1 Political overview

Tanzania gained independence in 1961 and became the United Republic of Tanzania in 1964 (with the unification of mainland Tanzania and the nearby island of Zanzibar). Initially led by President Julius Nyerere, the country took a socialist path to its approach to economic and political development. In 1992 the country transitioned to multi-party democracy after the term of the second President (Ali Hassan Mwinyi, President from 1985 - 1992). Throughout this time, the country has had various national development plans that have shaped the way science, technology and innovation have been promoted in the country. Nyerere for example introduced a form of African socialism (known as Ujamaa) to Tanzania which has been highly influential in the way the country has developed especially in terms in its initial years of independence on developing its agricultural base and the creation of indigenous industry through an import substitution policy that included nationalisation and the creation of large state owned industry.<sup>1</sup> Since the 1980s, international actors such as the IMF and World Bank have influenced the industrialisation and science funding environment; especially through structural adjustment programmes from the mid-1980s until 2015.

Also important in the political landscape has been the relationship between mainland Tanzania and the island of Zanzibar. The result is that there are different development plans for the mainland (Tanzania Development Vision 2025) and for Zanzibar (Zanzibar Vision 2020), different research agendas for each as well as separate Ministries in charge of science and technology and research clearance procedures.

#### 1.1.1. Actors in Tanzania’s STI space and its national system of innovation

The two major policy actors within Tanzania’s national system of innovation are:

##### 1. The Ministry in charge of STI

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<sup>1</sup> [https://www.wider.unu.edu/sites/default/files/Events/PDF/Wangwe\\_0.pdf](https://www.wider.unu.edu/sites/default/files/Events/PDF/Wangwe_0.pdf) (accessed 09/06/17)

In 2017 this Ministry is the Ministry of Education, Science, Technology and Vocational Training. Formerly STI came under the mandate of the Ministry of Communication, Science and Technology (MCST; 2008 - 2015) and before that the Ministry of Higher Education, Science and Technology (1990 – 2008). There has never been a dedicated Ministry of Science and Technology in Tanzania (Mourten et al, 2013).

## **2. The Commission for Science and Technology (COSTECH)**

COSTECH was formed in 1986 when UTAFITI (the national research council) was reorganised. Its role is to advise government on STI, promote and facilitate STI activity and evaluate such activity. COSTECH has a variety of committees that manage COSTECH activity at a sectoral level e.g. through a health committee, agriculture committee etc. COSTECH is a parastatal coming under the MCST.

The national innovation system is also made up of:

### **1. Universities**

Tanzania has over 50 universities and colleges (MoFP 2016a). The sector has struggled in the last year or so due to various scandals<sup>2</sup> however and the quality of graduates has been questioned.<sup>3</sup>

### **2. Research institutes (public and private)**

Details of government research institutes is provided in Section 2 below. In addition to these, there is also one research institute dedicated to studying Tanzania's STI activities, STIPRO ([www.stipro.or.tz](http://www.stipro.or.tz)) and a number of other research institutes that provide research and analysis on economic and social development issues including but not limited to REPOA ([www.repoa.or.tz](http://www.repoa.or.tz)) and the Economic and Social Research Council (<http://www.esrftz.org>)

### **3. Government institutes and offices such as the National Bureau of Standards**

The government has a number of different offices that regulate business activities which all impact on the degree of STI that takes place, especially in the private sector.

### **4. The private sector**

Tanzania is pushing an industrialisation agenda through its FYDP II and more generally in recent years (Wangwe, n.d.) with a specific focus on building up micro, small scale and medium sized businesses. These are a vital part of the national innovation system.

## **1.2 Economic overview**

The average growth rate in Tanzania has been 7% over the last decade. The country has an unemployment rate of 10.3% although in Dar es Salaam (the economic capital and largest city) its 21.5%. The agricultural sector employs the majority of the working age population in Tanzania (66.9%) and contributes 23% of GDP. Some (Diyamett et al, 2016) note figures that show the agricultural sector employs as much as 80% of the population. The agricultural sector has also been growing slowly at only 3.4% in 2014 from 2.76% in 2010 against a target in the first Five Year Development Plan (FTDP I) of 6% (MoFP, 2016a). However, the services sector is increasing although manufacturing is responsible for only 5.2% of GDP while building and construction sector is responsible for 12.7% of GDP. (MoFP, 2016a). The country has become less dependent on donor

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<sup>2</sup> <http://www.thecitizen.co.tz/magazine/success/2016--a-year-that-saw-changes-in-education/1843788-3505384-14ofuqn/index.html> (accessed 07/06/17)

<sup>3</sup> <http://allafrica.com/stories/201702230405.html> (accessed 07/06/17)

funding and support between 2007 and 2012 with UNESCO arguing that “[a]s the economy becomes less reliant on donor funding, it may gradually diversify.” (UNESCO, 2016: 559).

Despite these high levels of growth, Tanzania is still listed as a least-developed country. Poverty has reduced in Tanzania but still affects almost half the population, reducing from 57% in 2007 to 46% in 2011.<sup>4</sup> Although there are reports that as much as 70% of Tanzania’s population lives on less than 2 US dollars a day.<sup>5</sup>

According to the World Bank’s Ease of Doing Business report 2017, Tanzania is improving as a location for business moving up the rankings from 139 to 132 out of 189 countries for ease of doing business. As noted in the FYDP II the country’s private sector “most hurdles when dealing with construction permits and paying taxes. Policy and institutional constraints, energy shortfalls, shortages of skills and problematic access to land for industrial purposes still impede growth of the private sector. In addition, in the absence of a one-stop window for most agencies (even at the TIC [Tanzania Investment Centre]), the multiplicity of charges/fees imposed by various control and regulatory agencies will continue to increase cost of doing business in terms of finances and time.” (MoFP, 2016a: 13)

In its efforts to promote economic and social development the country has embarked, over the years, on a number of development plans. Currently the country is working towards the overarching Tanzania Development Vision 2025 (and for Zanzibar Vision 2020). Until 2015 the country worked towards this through a National Strategy for Growth and Reduction of Poverty (NSGRP) or MKUKUTA as was known in Kiswahili. This was also supported by a first Five Year Development Plan (2011-2016) and now a second Five Year Development Plan, FYDP II from 2017 to 2022. These development plans have moved attention from growth through development of the agricultural sector to a wider focus on industrialisation. In fact, when the themes of the previous, current and future five year development plans are reviewed there appears to be a clear step-wise economic development process being proposed:

FYDP I – theme: “Unleashing Tanzania’s latent growth potential”

FYDP II – theme: “Nurturing an Industrial Economy”

FYDP III – theme: “Realising competitiveness-led export growth”

### An overview of the current state of STI in Tanzania by indicator

The 2015 UNESCO Science Report is the latest document that provides published data on Tanzania’s current state of STI by internationally recognised indicators. Data provided in the report shows the following:

- Tanzania’s investment in R&D, also called Gross Domestic Expenditure on Research and Experimental Development (GERD), as a percentage of GDP was 0.38% in 2010 (latest available figure against its target of 1%. [NB: more recent, less partial data from the World Bank puts GERD in Tanzania at 0.53% in 2013].
- In 2010 42% of GERD was from foreign sources as opposed to 0.1% from the local business sector and 57.5% from government.
- Tanzania has a low density of researchers per million inhabitants in East and Central Africa at 69 compared to Kenya (318).

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<sup>4</sup> <http://data.worldbank.org/indicator/SI.POV.DDAY?locations=TZ&view=chart> (accessed 10/06/17)

<sup>5</sup> <http://www.worldbank.org/en/country/tanzania/publication/tanzania-mainland-poverty-assessment-a-new-picture-of-growth-for-tanzania-emerges> (accessed 10/06/17)

- Tanzania has a low number of female researchers as compared to other African countries with only 25.4% (2010) female researchers compared to over 40% in Namibia, South Africa and Mauritius.
- Tanzania has moderate publication success in East and Central African with 770 scientific publications compared to Kenya with 1,374 papers and Ethiopia at 865. The majority of scientific papers published by Kenyan based researchers between 2008 and 2014 were in the field of biological or medical sciences (2,323 papers) as opposed to agriculture (17 papers).

## 2. Tanzania's science, technology and innovation system

As noted above, in 1968, shortly after independence the country formed its first National Scientific Research Council known as UTAFITI, while the first university (University of Dar es Salaam) was created in 1970 (it had previously been a college). This basis was assisted by a colonial science legacy that had seen the first research institute set up in Tanzania in 1905 (a veterinary laboratory) by the German colonial government. When the British took over the country in 1919, they reorganised the science landscape and in 1948 took a sub-regional approach creating an East African High Commission that divided scientific research across East Africa and selecting mainland Tanzania as the focus for malaria research. (Diyamett et al, 2010)

Since independence the country has developed a network of research institutes in the areas of industrial development, agriculture, health and natural resources; agricultural research institutions dominate. The current list of research institutes in Tanzania is as follows:

### **LIVESTOCK RESEARCH INSTITUTIONS**

Tanzania Veterinary Laboratory Agency (TVLA)  
Central Veterinary laboratory (CVL)  
Centre for Infectious Disease and Biotechnology  
Vector and Vector Borne Diseases Research Institute (VVBDI)  
Tanzania Vaccine Institute (TVI)  
Tanzania Veterinary Laboratory Agency (TVLA) - Arusha  
Tanzania Veterinary Laboratory Agency (TVLA) - Iringa  
Tanzania Veterinary Laboratory Agency (TVLA) – Mwanza  
Tanzania Veterinary Laboratory Agency (TVLA) – Mtwara  
Tanzania Veterinary Laboratory Agency (TVLA) – Tabora  
Tanzania Veterinary Laboratory Agency (TVLA) – Dodoma  
Vector & Vector-Borne Diseases Research Centre- Tanga  
Tanzania Livestock Research Institute (TALIRI) – Mpwapwa  
Tanzania Livestock Research Institute (TALIRI) – Mabuki  
Tanzania Livestock Research Institute (TALIRI) – Naliendele  
Tanzania Livestock Research Institute (TALIRI) – West Kilimanjaro  
Tanzania Livestock Research Institute (TALIRI) – Tanga  
Tanzania Livestock Research Institute (TALIRI) – Uyole  
Tanzania Livestock Research Institute (TALIRI) – Kongwa

### **AGRICULTURE AND LIVESTOCK INSTITUTIONS**

Mikocheni Agricultural Research Institute (MARI)  
Sugarcane Research Institute Kibaha (SRI-KIBAHA)  
Agricultural Research Institute KATRIN, IFAKARA. (ARI KATRIN IFAKARA)  
Ilonga Agricultural Research Institute (ARI ILONGA)  
Agricultural Research Institute (ARI) UKIRIGURU  
Tanzania Coffee Research Institute (TACRI)-LYAMUNGU  
Agricultural Research Institute – SELIAN  
Tengeru Agricultural Research Institute (HORTI TENGERU)  
Mlingano Agricultural Research Institute  
Agricultural Research Institute (ARI) UYOLO  
Tanzania Pesticide Research Institute (TPRI).  
Tea Research Institute Maruku (TRIT)  
Agricultural Research Institute Maruku (ARI-MARUKU)  
Tobacco Research Institute Of Tanzania (TORITA)  
Cholima Research Centre, DAKAWA

Agricultural Research Institute – Naliende  
Naliendele Cashewnut Research Centre  
Agricultural Research Institute – Kizimbani

**INDUSTRY AND ENERGY INSTITUTIONS**

Tanzania Bureau Of Standards (TBS)  
National Construction Council (NCC).  
National Housing And Building Research Agency (NHBRA)  
Tanzania Automotive Technology Centre (TATC)  
Tanzania Engineering And Manufacturing Design Organization (TEMDO)  
Tanzania Atomic Energy Commission (TAEC).  
Centre For Agricultural Mechanization And Rural Technology (CAMARTEC)  
Tanzania Industrial Research And Development Organization (TIRDO)  
Small Industries Development Organization (SIDO)

**NATURAL RESOURCES INSTITUTIONS**

Tanzania Fisheries Research Institute (TAFIRI)  
Tanzania Forestry Research Institute (TAFORI)  
Tanzania Wildlife Research Institute (TAWIRI)  
Ngorongoro Conservation Area Authority (NCAA)

**MEDICINE AND PUBLIC HEALTH INSTITUTIONS**

National Institute For Medical Research (NIMR HQ)  
Ifakara Health Institute (IHI)  
Amani Medical Research Centre (Part Of Tanga Medical Research Centre)  
Mwanza Medical Research Centre (Part Of NIMR)  
Tukuyu Medical Research Station (Part OF NIMR)  
Tanzania Food and Nutrition Centre (TFNC)<sup>6</sup>

The country has moved from a position of having only one university to having over 50 tertiary education organisations (MoFP, 2016a). Specifically, Tanzania had 26 universities (10 public and 16 private) and 15 university colleges (4 public and 11 private) in 2016 (MoFP, 2016b). Despite the growth in universities, university enrolment was just 2% in 2010 (latest figures available)<sup>7</sup> and government expenditure on education has decreased from 1.27% of GDP in 2008 to 0.76% in 2014 (UNESCO, 2016).

However, while UTAFITI was set up in 1968, it was not until 1978 that it received its first Director and it wasn't until 1985 that the country developed its first Science and Technology Policy. Yet, in general, the country has focused significantly on the importance of science and technology (and more recently on innovation) through a number of different policy documents since independence; influenced by frequent reorganisation of Ministries and movements to new development plans. This has however not always resulted in joined up thinking resulting in the late 2000s with a request to UNESCO for assistance with the development of STI policy support (Nkunga, n.d.). A timeline of key events is outlined in Table 2 below.

**Table 2: Timeline of key policy and strategy events and organisations' founding**

1905	First research institute opens in Tanzania
1961	Tanzania gains independence

<sup>6</sup> [http://www.costech.or.tz/?page\\_id=1618](http://www.costech.or.tz/?page_id=1618) (accessed 10/06/17)

<sup>7</sup> <http://www.sarua.org/files/Country%20Reports%202012/Tanzania%20country%20profile%20Eng.pdf> (accessed 12/06/17)

1968	National Scientific Research Council (UTAFITI) is formed with objective of stimulating science and technology for socioeconomic development UTAFITI sits within the Ministry of Education
1970	University of Dar es Salaam, the country's first public university opens its doors
1980	UTAFITI moves from Ministry of Education to Ministry of Planning and Economic Affairs
1985	First Science and Technology Policy enacted creating COSTECH to replace UTAFIGI and science and technology coming under the mandate of the Ministry of Higher Education, Science and Technology (MHEST)
1990	MHEST formed officially and policy formulation moves from COSTECH to a new Department of Science and Technology within MHEST
1996	National science and technology policy revised. This outlined the legal framework for science and technology in Tanzania and put all research activity under COSTECH and MHEST. It also promoted women in science and technology.  The implementation of the policy led to the establishment of several new research institutions such as the National Institute for Medical Research (NIMR) and the Government Chemist and Tanzanian Food and Drug Administration. It also promoted the use of clusters as a form of enterprise development and innovation mechanism and the creation of various policy documents e.g. national policies on biotechnology, technical and vocational training and ICT.  The policy also created the National Fund for the Advancement of Science and Technology (NFAST).
2000	Tanzania Development Vision 2025; an overarching national development strategy is enacted
	Zanzibar enacts the Zanzibar Vision 2020 national development strategy
2003	The Science and Technology sub-master plan (2003 – 2018) was launched
	NFAST becomes operational in July 2003
2005	MKUKUTA I (2005/06 - 2009/10) was introduced, the first National Strategy for Growth and Reduction of Poverty Strategy (NSGRP)
2006	A policy review of the science and technology policy of 1996 was initiated
2008	Science and Technology remit is moved from MHEST to Ministry of Communication, Science and Technology.  The review of the S&T policy continues.
2009	President Kikwete launches 'Kilimo Kwanza' (Agriculture First') as a major initiative to ensure the country reached its Vision 2025 objectives.
2010	Science and Technology Policy is revised and becomes the National Research and Development Policy
	MKUKUTA II is introduced
2011	Long term Perspective Plan (LTPP) 2011/12 – 2025/6 is launched following review of progress towards the National Development Vision 2025
	The first Five Year Development Plan (FYDP I 2011/12 – 2015/6) is enacted with the theme "Unleashing Tanzania's latent growth potential"

2012	A review of the National R&D Policy is initiated
2015	COSTECH publishes Research Priorities for Tanzania 2015 – 2020 focusing on 15 sectors and 5 sub-sectors. Zanzibar publishes the Zanzibar Research Agenda 2015 – 2020.
	Science and technology comes under the remit of the newly constituted Ministry of Education, Science, Technology and Vocational Training
	In May the government merges the two planning frameworks MKUKUTA and FYDP.
2016	The FYDP II (2016/7 – 2020/1) is enacted with the theme “Nurturing an industrial economy”.
2021	The FYDP III will be enacted with the theme “Realising competitiveness-led export growth”

### 3. Research funding activities in Tanzania by the Science Granting Council

#### 3.1 Research funding: the numbers

Tanzania has set the target of 1% of GDP per capita to be spent on research and development. Currently expenditure across all funding sources is 0.38% as per the latest figures from 2010. The government provides the majority of this funding although foreign donors provide 42% of the funding. All of the funding goes either to government research institutions or higher education. Table 3 provides details of the funding broken down by source of funds and sector of performance.

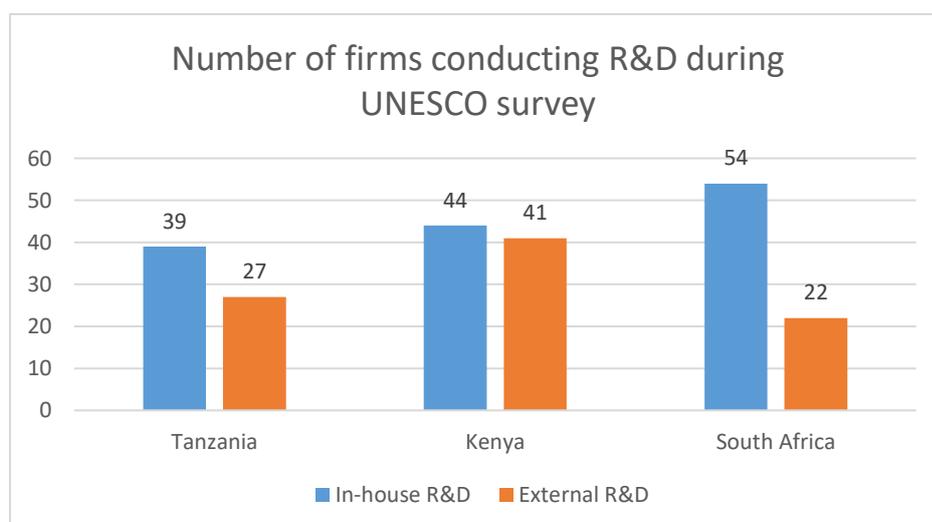
**Table 3: R&D spend by source of funds and sector of performance (% , 2010 latest figures)**

	R&D funding by source of funds	R&D funding by sector of performance
Business	0.08%	0.08%
Government	57.53%	14.00%
Higher education	0.33%	86.25%
Private non-profit	0.05%	0%
Foreign	42.00%	

Source: UNESCO, 2016

While business enterprises only provide 0.08% of R&D funding reported in Tanzania, the level of innovativeness that is reported is not significantly different from Kenya or South Africa. The ASTII report highlighted that 61% of firms surveyed for that report said that they were engaged in innovation activities (UNESCO, 2016). The figures provided in the UNESCO Science Report 2015 for innovativeness of firms is provided in Figure 1 below, comparing with Kenya and South Africa.

**Figure 1: Manufacturing firms active in R&D internally and externally (% of those surveyed)**



Source: UNESCO, 2016

### 3.2 Research funding: organisation

The Science Granting Council in Tanzania is the National Fund for the Advancement of Science and Technology (NFAST) created by the 1996 Science and Technology Policy. The Fund has been operational since July 2003 and sits within COSTECH in Dar es Salaam. Prior to NFAST, research grants were provided by UTAFITI.

The NFAST was set up with an initial investment of 63.4million TShs (approximately 100,000 US dollars at the time) of which 75% came from the Danish government through Danida and the rest from the MHEST, the Zanzibari President and a charity walk. This is below the 1 billion TShs target the government aimed for.<sup>8</sup>

NFAST provides funding for:

1. Open Research Grants
2. Commissioned Research Grants
3. Fellowships
4. Support to:
  - a. R&D and higher learning institutions
  - b. Attend scientific meetings
  - c. Host scientific meetings
  - d. Schools

COSTECH is also responsible for several scientific awards:

1. Tanzania Award for Scientific and Technological Achievements (TASTA)
2. National Award for Research in Science and Technology (NARST)
3. National Award for Environmental Management (NAEM)
4. School Science Award (SSA)

The COSTECH website states that “While TASTA award caters for tangible achievements in STI, the other three awards cater for the development of scientific theories, contribution to STI achievements without necessarily having to invent/innovate or discover. As of July 2008 a total of 31 awards have been issued.”<sup>9</sup>

The NFAST has awarded 76 research grants and 517 grants to post-graduate researchers (34 Masters students and 174 PhD students) between 2010 and 2015 (Msangi et al, 2015). Furthermore, 56 projects have been funded between 2012-2015 through the Kilimo Kwanza initiative and 15 have been funded as a result of a joint South Africa – Tanzania joint initiative.

Researchers in Tanzania – like those in some other African countries – can also benefit from external funding opportunities such as through the Leverhulme-Royal Society Africa Awards or through bilateral arrangements with foreign universities and donors, such as Sida’s support to the University of Dar es Salaam.

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<sup>8</sup> [http://www.costech.or.tz/?page\\_id=1616](http://www.costech.or.tz/?page_id=1616) (accessed 07/06/17)

<sup>9</sup> [http://www.costech.or.tz/?page\\_id=1702](http://www.costech.or.tz/?page_id=1702) (accessed 07/06/17)

## 4. Factors influencing activities and performance of SGCs and STI activities in Tanzania

During the literature review and the key informant interviews undertaken for this project, a number of political and economic constraints and enablers were identified that have the potential to have influenced, or have been identified as having already having influenced, activities and performance of the SGCs and/or STI activities more generally in Tanzania. This section briefly outlines these constraints and enablers. It should be noted that the constraints and enablers that are outlined below all require further analysis. The interviews and literature review were conducted to provide an indication of the issues that are being faced by Tanzania's STI community and its SGC so that such further analysis can be conducted and remedial action taken where required. The key informants chosen were purposively selected due to their knowledge of the STI field in Tanzania and having interacted regularly with the SGC and allied organisations. The number of key informant interviews conducted was less than 10 but the field as a whole is not large in Tanzania. We believe that the key informants interviewed represent the breadth and depth of views likely to be have been received by others working in this arena.

### 4.1 Overarching political constraints and enablers

#### 4.1.1 Cohesion between policy mechanisms

During the desk study and the interviews the issue of multiple development plans and the changing focus of these development plans was mentioned. Interviewees highlighted the shift in policy from Kilimo Kwanza to Industrial Tanzania was significant and was influencing science activities in the country. Linked to this, the desk review highlighted that reforms and policy reviews were taking place in relation to education policy and industrial policy. These have an impact on the science and technology policy and related activities but there appears to be little alignment of thinking across ministries and sectors.

#### 4.1.2 Organisational set up of the science funding system

There were two major organisational issues that were raised during the interviews and the desk review. The first relates to the above issue and the coordination – or lack thereof – across ministries. The second was the degree of autonomy given to COSTECH and the NFAST for research funding. These both relate to the fact that the Ministry in charge of science and technology has regularly been changed (three different Ministry formulations in the last 10 years). That said, COSTECH has been a stable organisation throughout these changes since its set up in 1986. However, the interviews did highlight a strong current of thought that COSTECH should become even more autonomy and no longer have to report to the Ministry in charge of science and technology. The interviewees also highlighted a lack of coordination across ministries and particularly the existence of research centres sitting in other ministries such as the Ministry of Health or Ministry of Agriculture. One interviewee focused on how this was resulting in a duplication of work and competition for funds between research institutes (under sector Ministries) and universities (under the Ministry for Education).

All of this has implications on the autonomy of COSTECH and NFAST to manage research funding. One interviewee noted how research funding was influenced by a wider set of issues such as the ceiling on Ministerial funding. Others highlighted the continued dependency on donor funds which

remains at over 40%. Others mentioned the existence of parallel funding by donors and non-alignment of priorities.

## 4.2 Overarching economic constraints and enablers

### 4.2.1 Changes in donor support and priority of funding

The desk review and the interviews highlighted changes in the level and type of donor support Tanzania is receiving in recent years; both generally and specifically with regards to science funding. At the same time, there was acknowledgement that the government was also changing its focus on what to fund. The main points that were raised here include:

1. Foreign assistance from international development partners is changing both as a result of the relaxation of the structural adjustment programme requirements and because of changing priorities of donors themselves
2. The Tanzanian government is changing its focus of attention through its national development plans for the Tanzanian mainland and Zanzibar
3. Government funding of R&D has reduced slightly (in 2007 government provided 60.58% of R&D funds as compared to 57.53% in 2010) and foreign sources of funding have increased (from 38.36% in 2007 to 42% in 2010).
4. R&D funding has moved from being more evenly split between government research organisations (42.10%) and higher education (54.12%) in 2007 to virtually all funding (86.25%) going to higher education organisations in 2010
5. Interviewees highlighted a move from basic research to applied and impact focused research (see below)

### 4.2.2 Funding from private sector

Tanzania has moved significantly towards an industrialisation strategy and national development strategy that focuses on the important role, and promotion, of the private sector as a key enabler of economic development for the country; especially in more recent economic development strategy documents. The focus of FYDP II is on micro small and medium sized enterprises and light manufacturing to enhance job creation and skills development. There is a focus on the role of technology acquisition as a means of gaining skills and capability.

Despite this, and a relatively high level of R&D activity by the manufacturing firms in Tanzania (being not far behind Kenya or South Africa), private sector investment in R&D is low. The interviewees, however, focused on the private sector being active in discussions in the areas of science funding and STI promotion but not 'research active'. This is perhaps at odds with the figures outlined in Figure 1. Having said that, it was noted that the private sector telecommunications firms all have to provide a percentage of money made by the mobile phone operators in Tanzania is given directly to the NFAST. In addition, farmers pay for research in the areas of coffee, tea and tobacco through a ring-fenced scheme.

### 4.2.3 Impact of funding

Several interviewees discussed the way research funding was having to become more impact oriented. This might be because of the lack of movement towards the 1% of GDP for R&D goal; as a means of making the little that is available more effective. In fact, one interviewee did suggest this when he stated, to paraphrase, that 'it wasn't how much that was invested in R&D that mattered but what was done with it which was key'.

## 5. Conclusion and recommendations

This national case study report has provided an overview of the political and economic context of the Tanzanian STI field. It has narrowed down into the make-up and operation of STI activities in the country and the funding of research, specifically through the COSTECH and the SGC mechanism hosted there: the National Fund for the Advancement for Science and Technology (NFAST). The key findings are:

1. Tanzania's science funding and STI activities are promoted through a series of science focused policies as well as wider economic and social development policies. This creates a complex policy environment for stakeholders to work in.
2. Tanzania has a relatively good level of R&D expenditure compared to others in the region at 0.53% of GDP against its 1% of GDP target
3. Science funding in Tanzania is managed by a SGC mechanism, NFAST, under the auspices of COSTECH which in turn is under the mandate of the Ministry in charge of science and technology.
4. The NFAST has been operational since 2003 and has distributed a variety of grants and scholarships over the past 15 years however there is potential for duplication of effort due to parallel donor programmes and the existence of sector ministries with research portfolios.

As a result, and based on the evidence reviewed during this study, the following recommendations for Tanzanian STI and research funding stakeholders are made.

### 5.1 Recommendations for the Tanzanian SGC

#### 5.1.1 Further mobilisation of the private sector

The existence of two funds that see the private sector support science funding through hypothecated funding is to be applauded. However, it is recommended that these initiatives are built on so as to encourage further investment. For example, further efforts could be made to advertise the impact of the results of the funding from these ring-fenced funds.

#### 5.1.2 Encouraging cohesion of policy initiatives

As outlined in Table 2, the history of the various science specific and more general national development strategies and the various agencies to promote these is long and complex. While there have been efforts to streamline policy direction more could be done, especially to enhance cooperation between sector ministries and the Ministry in charge of science and technology.

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