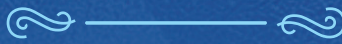


SCIENCE GRANTING COUNCILS INITIATIVE PROJECT REPORT



POLITICS AND POLICY IN KNOWLEDGE PRODUCTION FOR DEVELOPMENT



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in Knowledge Production
for Development**

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Executive summary

The majority of African governments still spend less than the target of 1% of their gross domestic product (GDP) on research and development (R&D) which was agreed to more than four decades ago in the 1980 Lagos Plan of Action. Nonetheless, there has been some progress made as some African countries have been increasing their funding pool and establishing independent science granting councils (SGCs) to manage funds allocated to R&D.

These SGCs are accountable for how they spend public funds and ensuring that the research they support contributes to society's advancement. In this regard, there are various ways in which SGCs and researchers could demonstrate that research contributes to the advancement of society.

However, key stakeholders have divergent expectations regarding what such contributions consists of and what constitutes a worthwhile return on the investment made in research. These expectations seem to have led to greater support for applied research than for basic research.

While there is acknowledgement that different modes of knowledge production need to be supported, the

tendency is to lean more towards supporting applied research as the preferred method for addressing the most important of various competing societal needs.

It is in this context that this study aimed to initiate dialogue on how research priorities are set and how research is funded and governed.

This report explores barriers to funding research at an appropriate level with the hope of opening up dialogue on how research is funded and governed. In addition to understanding the barriers to increasing research funding, various strategies used to source funds are explored as well as how research priorities are determined and then supported through funding allocations.

The goal is to expand the existing knowledge base with up-to-date information on governance structures, levels of funding, innovations, and best practices to inform and support the work of the Science Granting Council Initiative (SGCI). Furthermore, the hope is that the information generated will inform policies regulating research funding and governance structures.



1 Background

The Science Granting Council Initiative (SGCI) in Africa is a project set up mainly for peer learning amongst participating SGCs and to improve the management and funding processes for research on the continent (Ozor et al., 2020). Independent Science Granting Councils (SGCs) in the various African countries are tasked with the responsibility of supporting research as part of an effort to promote the overall development in their specific countries (Tigabu & Khaemba, 2020; Mouton et al., 2015). The SGCI was set up to include members from countries with no formal SGC structures to harness and build the capacities of these various SGCs (Ozor et al., 2020; Mouton et al., 2015). According to Ozor et al. (2020), the SGCI is a platform for supporting and strengthening the capacities of the SGCs in Africa in their various roles. Initiated in the year 2015, one of the objectives of the SGCI in sub-Saharan Africa is to enhance the skills to manage research funds and monitor research programmes using robust science, technology and innovation indicators (SGCI, 2018; Mouton et al., 2015). The initiative is funded by international donors and operates across 16 African countries (Tigabu & Khaemba, 2020; SGCI, 2018).

One of the ways through which the SGCI advances its goals is through the Annual Fora that bring together the 16 member countries in Africa and other stakeholders to deliberate and outline interventions on key issues affecting the continent (Tigabu & Khaemba, 2020; SGCI, 2018a). During such meetings, there are peer learning activities such as the Master Classes where a comprehensive report is provided on commissioned research for the purpose of learning. The idea is to harness the potentials of research in furthering evidence-based policies, promoting science, technology and innovations and generally enhancing socio-economic development on the continent (SGCI, 2018/2018a; SGCI, 2017).

An ongoing topic of discussion at the annual SGCI and Global Research Council's gatherings is how science granting councils (SGCs) are governed – particularly in terms of their management structures, how priorities are set, and how their funding is negotiated and allocated. These convenings have provided an opportunity for informal peer learning and engagement amongst senior management on various topics that include governance structures. However, the topic on governance has not been explored in depth.

This report aims to contribute to this discourse by sharing the findings of a study we conducted to investigate SGC models and funding in four African countries. There were four SGCs, namely:

1. Strategic Support for Scientific Research Programme (PASRES) in Côte d'Ivoire,¹
2. The National Research Fund (NRF) in Kenya,²
3. The National Science and Technology Council (NSTC) in Zambia,³ and
4. Botswana as a participant through its Department of Research Science and Technology (DRST)⁴ which is under the umbrella of the Ministry of Tertiary Education, Research, Science and Technology.

The report shares information on funding structures and how development priorities are set for funding purposes. The report also shares information on the funding of research, how research is used for innovation, and the importance of the valorisation⁵ of research for social impact. The report includes recommendations on strategies that might help in unlocking additional funds to support research.

1 <https://www.csr.ch/pasres/>

2 <https://researchfund.go.ke/>

3 <https://nstc.org.zm/>

4 <https://www.gov.bw/ministries/ministry-tertiary-education-research-science-and-technology>

5 "The term 'valorisation' means to give or assign a value, especially a higher value. When it comes to research results, their valorisation encompasses many activities which render the research results accessible to, and usable by, society and economy. This valorisation is often equated with knowledge and technology transfer" (University of Luxembourg, 2022). https://www.wen.uni.lu/research/researchers_research/valorisation_of_research_results



2 Introduction

Applying knowledge generated through research in solving societal problems has gained more traction since the renaissance period (14th to 17th century) and has become indispensable for some societies (Konig, 2017). Aside from the invention, innovation and development that comes with the scientific knowledge generated through research, this knowledge is fast becoming the foundation upon which governments formulate and implement policies (Bailey, 2010; Koenig, 2005; Konig, 2017; National Research Council, 2008). The research–policy nexus is a topic of interest amongst scholars and governments. Many governments – for example, the United States (US) and those in the European Union – are increasingly using research products and knowledge produced to frame policy (Gluckman, 2013; Nutley et al., 2002; Soare, 2013; National Research Council, 2008).

Knowledge produced through research has the potential to influence policy decisions because it provides empirical knowledge based on studied and observable trends. These scientifically generated insights enable predictions regarding the trajectories of societal strengths, weaknesses, opportunities and threats (Haas & Kwaak, 2017). Consequently, countries in the Global North have been continuously increasing the proportion of their gross domestic product (GDP) dedicated to funding research and development (R&D) since World War II (Harris, 2015). Governments in sub-Saharan Africa (SSA), on the other hand, have struggled to fund research at a high level and, in turn, have been reported not to rely on research evidence as a main driver of policy making (Bailey, 2010; Naude et al., 2015). Through this study, we have observed a situation that is gradually changing as governments start to draw more on research produced for policy work, but to a limited extent.

Reasons identified for the low level of funding allocated to research in Africa include a low government base of funding, poor democratic culture, over-centralisation of government functions, elite fragmentation, ideological conflicts, poor decision-making and external influences (Bailey, 2010; Mouton, 2008; Osagie, 2012). As funds from domestic SGCs have become grossly insufficient over the years, the lacuna has mostly been filled by foreign SGCs who step in to fund research agendas

which are, in most cases, aligned with their own priorities (Chataway et al., 2019; Jaumont, 2006; Mouton et al., 2015; Tijssen & Kraemer-Mbula, 2018). Donor funds help, but are insufficient and often difficult to access for most researchers – especially early-career researchers – due to lack of experience in operating in the highly competitive territory of grant applications. Early-career researchers need all the support available because they form the foundation for the next generation of academics and researchers.

The literature explored for this report focuses on the research–policy nexus in SSA and the trends in domestic governments’ funding of research and utilisation of research outcomes. No literature could be identified that focuses on the internal dynamics of relationships within and between SGC officials and other relevant bodies, and how these dynamics could influence the ability of researchers to access funds for research. The focus of the study was on understanding the governance structures and relationship dynamics within and between the management staff of SGCs and other relevant bodies such as members of boards. More specifically, the study sought to understand the strategies, challenges and opportunities associated with these structures and relationships, with the ultimate goal of increasing research funding levels and promoting the uptake of research for development in Africa. The study project faced challenges during the data collection process, and the limitations are addressed fully later in this report. The report begins with an exploration of the literature looking at the research–policy nexus and, more specifically, at challenges associated with funding of research as well as with translating research into policy.

3 Research-based policy through a global lens

The use of research in formulating policy gained traction just after World War II and became a standard of best practice for governmental and non-governmental organisations towards the end of the 20th century (Bailey, 2010). Consequently, nations of the Global North are striving to base their policies on empirical research.



There are several examples of this globally. For example, a recent study carried out by Haas and Kwaak (2017) demonstrated that, in the Netherlands, research plays a major role in policy decisions. There is robust use of evidence, as Gluckman (2013) has demonstrated, in New Zealand in the framing and implementation of policies. In the United Kingdom (UK), there is a Centre for Evidence-Based Policy and Practice, which is funded by the Economic and Social Research Council. Its task is to improve the accessibility, quality and usefulness of research; develop methods for appraising and summarising research relevant to policy and practice; and advise those in policy-making roles through its dissemination function (Nutley et al., 2002). In India, the National Institute for Educational Planning and Administration, an academic institution, was set up by the Ministry of Education to provide policy advice based on their research

The UK government is estimated to invest over £3 billion annually in research and requires funding applicants to demonstrate the contribution of their research to society and the economy (Harris, 2015). In the US, government policy relies heavily on research outcomes. For example, the US National Research Council (NRC, 2008) reported the following with regards to the important role research plays in the policies of the US Department of Housing and Urban Development (HUD):

research on major housing issues and programs tends to be ongoing, with new research projects being developed on the basis of findings of earlier research and on program outcomes. Each HUD administration is able to draw on that body of research, each is able to add to it during its term, and each leaves behind it a body of completed studies and studies in process that are intended to be of use to its successor. (NRC, 2008, p. 150)

The Global North has demonstrated that research has a significant role to play in the development of any society. However, in our search we did not find literature on the specific use of academic research outputs for policy formulation.

The following section explores the extent to which research evidence is utilised for policy formulation and development purposes in various countries in Africa.

4 Research-based policy: Regional reflection

This study chose not to draw from the literature on the Global South as a whole but instead to focus on case studies from Africa. The literature reveals that there is limited work on the relationship between knowledge production and development in Africa (Bailey, 2010). However, available studies indicate that there has been an enduring disconnect between research and policy. Not only is most research generated in seeming isolation, but there is also a lack of institutional support and enabling frameworks for knowledge to be transformed into policies and initiatives that contribute to societal advancement. For instance, although government is a major funder of research in South Africa – especially in the public sciences (Mouton, 2006) – a study by Naude et al. (2015) revealed that research is not the main driver of policy in South Africa; rather, current contextual realities, costs, logistics and people (clinicians, funders, and NGOs) are the primary influences on policy. The study further found that research evidence is sometimes perceived as unavailable, inaccessible, ill-timed or not applicable (Naude et al., 2015). A similar study conducted by Olomola (2007) in Nigeria demonstrated that, even with the existence of policy-oriented research organisations in Nigeria, policy decisions do not draw from relevant research.

Olomola (2007, p. 165) argues that there are ‘major pitfalls in the research–policy nexus, including gaps in policy initiation, poor culture of policy development, policy confusion and uncertainties, and inadequate linkage mechanisms. He further notes that, in Nigeria, ‘the research and policy communities seem to work at cross-purposes’. Mouton (2008) acknowledges the resilience of African researchers when he notes that there is still ongoing and vibrant research in countries where there is little government support for research, poor institutional facilities and various other challenges. The central question thus becomes why, although scholars are conducting research, is research evidence often ignored by policy-makers?

In contrast, a few studies have found positive examples of the research–policy nexus functioning effectively in



Africa. For instance, an empirical study conducted on institutional policies implemented across four African states (Ghana, Uganda, Zambia and Sierra Leone) demonstrated a ‘relatively high’ use of evidence in policy debates, especially in Zambia (Broadbent, 2012, p. 2). The study also shows that there is a system in place in Kenya that ensures that research outcomes are valorised.

Having established that research evidence is generally not integral to policy formulation in Africa, it is imperative to explore the factors underlying this reality. The next section outlines hindrances to research driving policy formulation.

5 Challenges associated with research-based policy

In Africa, the factors hindering widespread adoption of research-based policy formulation are complex, spanning from the political structures to governance and challenges associated with nation-building. Bailey (2010) identified specific challenges affecting the research–policy nexus in Africa – namely, pseudo democracy (which is antithetical to pragmatic and popular decisions), over-centralised polity, constant antagonism with civil society groups, elitist but popular decision-making, and ideological divisions which engender biases and frictions amongst decision-making and research stakeholders.

Another commonly cited problem is that policy-makers come into contact with enormous amounts of information daily but have very little time to read, absorb and assimilate relevant information. Some politicians or decision-makers are ignorant about the availability of policy-relevant research, or, when they are aware of the research, can be ‘dismissive, unresponsive or incapable of using research’ (Bailey, 2010, p. 20). There is also the problem of the politicisation of evidence, which leads to research outcomes either not being utilised or being used in a way that support political agendas (St John, 2013).

A recent study by Lugo-Gil et al. (2019) identifies several challenges related to utilising research for policy. The first challenge is that researchers’ questions, time-lines and objectives do not always align with those of decision-makers. The second is that very few researchers and decision-makers work to establish mutually beneficial relationships. Third, research conducted in academia often fails to address the questions that programme and policy decision-makers want answered. The fourth challenge is that most research findings are presented in a manner that is not accessible to non-experts, and the products created do not meet the information needs of decision-makers. Finally, they noted that linking research to decision-making can be resource-intensive, and some government agencies possess limited capacity.

St John (2013) identifies four frames of action that are used to examine the roles of the government and the researcher in the research–policy nexus for government initiated research that could be helpful in understanding the relationship between research and policy. The first is the instrumental frame, in which the government agency desires evaluative studies to inform policy decisions, and the researcher produces the desired evaluative research. The second is the closed strategic frame, whereby the government agency seeks evidence that supports its policy initiatives, while the researcher changes methods to fit agency demands with findings subject to government approval. The third frame of action is the open strategic frame, where the government agency seeks new ways to tackle recurrent policy challenges, while the researcher focuses on issues concerned with new initiatives. There is scope in this third frame for collaboration on the interpretation and use of research products. Finally, the fourth is the communicative frame, whereby the government agency works with researchers to find new ways to solve challenges – particularly systemic injustices and inequalities – and researchers collaborate with policy-makers using qualitative and quantitative methods to address these.

A common feature of all four frames of action is the influence that the government has in the process, in cases where they are the initiator of the research. The nature and degree of influence varies, however, and determines the extent to which government dictates the research approach. Under the instrumental and closed strategic frames, the level of influence of the government is high and they play a large role in determining



the direction and goals of the research. Under the open strategic and communicative frames, government influence is lower and collaboration higher, making these the preferred frames of action for supporting an effective research–policy nexus. It is equally important to note that the government exerts influence because they provide funding for such research. International donors and grant providers are also significant sources of funding for research in Africa. Nonetheless, sufficient accessible funding continues to pose a major challenge to research in Africa. The next section explains the importance of funding, identifies the major funders and reveals the role of African governments in this regard.

6 Challenges in research funding in Africa

Research is dependent on funding from various actors such as government, foundations and donors, industry, and the private sector. The importance of science, technology, and innovation (STI) to the economic growth of the African continent has been asserted by various high-profile agencies and reports, and governments are displaying a growing interest in funding STI research across the continent (Mouton et al., 2015). The journey to knowledge-based economies for Africa began with the 1980 Lagos Plan of Action, expected to be fully implemented by 2000, where an agreement was reached that 1% of the national annual budget of all African states would be dedicated to science and research (SGCI, 2017). Furthermore, in line with African Union Development Agency-NEPAD (AUDA-NEPAD, 2017) objectives, many African governments have again committed themselves to increasing their GDP dedicated to R&D since they could not meet the deadline set by the 1980 Lagos Plan of Action.

The implementation of these agreements has been slow and inconsistent; in some cases, implementation is non-existent. A study by Mouton et al. (2014) found that the 1% target set for Africa remains elusive, with average expenditure on R&D in African countries being in the range of 0.3%–0.4%. In the four countries sampled for this study, the average expenditure ranges from 0.08%–0.8%. However, our findings revealed that these

figures are increasing, as governments are showing more commitment to funding research in Africa.

The research funding gap in African states has been filled to some extent by foreign bodies, governments, and jointly owned organisations such as the African Capacity Building Foundation, the African Economic Research Consortium, the Global Development Network, and the Secretariat for Institutional Support for Economic Research in Africa (Bailey, 2010). While such partnerships are welcome, the funding priorities and strategic goals should ideally be negotiated so that the relationship is mutually beneficial to all partners.

Scholars have debated the driving forces and politics behind partnerships between such grantmaking organisations and research institutions in Africa. According to Jaumont (2016), who studied the efforts of specific US-led foundations aimed at strengthening higher education capacity in SSA, the complexity and nuances in the grantor/grantee relationship leads to the definition of priorities. While the relationship between a partner who needs resources and the one who has the resources to give is often inherently unequal in terms of power and influence, Jaumont (2016) cautions against overly simplistic and extreme stances and describes the positive outcomes of these partnerships as follows:

American foundations have helped shift the national priorities of African countries toward the field of higher education by convincing international funders and national governments that higher education is the key to economic development. This has resulted in larger investments from all stakeholders and a shift toward modernization, institutionalization, and internationalization in African universities. (p. 88)

As STI is gaining national and continental attention (Chataway et al., 2019; SGCI, 2017, 2021), it is anticipated that more research funding will be made available by governments. This interest has been strengthened by the fact that the developmental initiatives of many African countries depend on the science and technology sector to provide effective solutions to developmental challenges in the form of renewable energy, medical innovations and eco-friendly power sources (Tigabu & Khaemba, 2020). Evidence of this shift in focus to STI can be seen in increased funding and the establishing of platforms for such endeavours through SGCs (Khaemba, 2018a; Tigabu & Khaemba, 2020).



Several African nations have set up SGCs with the aim of promoting scientific research to address developmental issues. The next section examines the establishment of the SGCI in Africa, with a specific focus on four countries.

7 Science granting councils in Africa

SGCs and equivalent bodies are in different stages of development in Africa. For example, those in South Africa, Tanzania, Kenya and Côte d'Ivoire are well established, operate independent of government ministries, and have their own boards. Other SGCs in countries such as Namibia, Botswana, Zimbabwe and Mozambique are in the early stages of establishment and are still part of the relevant ministries.

In a bid to strengthen the efforts of these SGCs and enhance an integrated approach to continental development, the SGCI was formed in 2015 as a five-year project. The SGCI project is a multilateral initiative funded by various organisations such as the International Development Research Council (IDRC), Canada, the UK's Department for International Development, and the National Research Foundation (NRF), South Africa (Hanlin et al., 2020; SGCI, 2017). Sixteen countries in SSA are participating in the initiative: Rwanda, Kenya, Uganda, Tanzania, Ethiopia, Côte d'Ivoire, Burkina Faso, Senegal, Ghana, Zambia, Zimbabwe, Mozambique, Malawi, Namibia, Botswana and Cameroon (SGCI, 2021). As the SGCI's Terms of Reference indicate, synergy between SGCs is important because of the need to eliminate the negative perceptions of the relationship with science research that private corporations and organisations on the African continent have (SGCI, 2018), which has been counter-productive to the development prospects of research-based institutes and centres.

Since the establishment of the SGCI, considerable developments have been tracked in member countries, although to varying degrees. According to recent data, the SGCI members in Botswana, Uganda, South Africa, Burkina Faso, Zambia, Mozambique and Malawi have made good progress in enhancing partnerships and collaborations with both other countries and the private

sector to promote innovative research and enhance public awareness of research efforts (Khaemba, 2018a; Khaemba, 2018b; Tigabu & Khaemba, 2020). Uganda has been particularly noted for establishing an online research management system utilised by its Council for Science and Technology, while countries like Ethiopia and Ghana have been noted for focusing on establishing innovative knowledge development systems (Tigabu & Khaemba, 2020).

Tanzania, through its SGC, reviewed and established a new national research and innovation policy in 2018. The initiative built on past steps that aimed to build the country's capacity for innovative research since the 1960s. The early steps taken contributed to Tanzania's global technological ranking increasing from 123 in 2013 to 92 in 2018 (Hanlin et al., 2020). Part of the progress made in Tanzania can be attributed to collaborations amongst various partners – including the private sector, academia and R&D institutions – and STI initiatives in the country. Nonetheless, adequate funding for prospective projects remains a major challenge (Fosci et al., 2019) – as is the case for the four SGCs forming part of the present study. These are explored in greater depth in the next section.

7.1 Science granting councils in Botswana, Côte d'Ivoire, Kenya and Zambia

Our focus now shifts to the four countries that participated in our study.

In Botswana, the Department of Research Science and Technology (DRST) was established in 2004 as part of the Ministry of Education, Research Science, and Technology (Khaemba, 2018a). The country's National Policy on Research, Science, and Technology, and Innovation guides research activities with a view to enhancing economic development and harnessing local technologies and innovations for improved quality of life (Khaemba, 2018a). The DRST partners with both domestic and international bodies and countries in pursuit of the aims of the national policy on STI. Other African countries in partnership with Botswana in science research are South Africa, Kenya, Mozambique, Zambia and Zimbabwe.

In Côte d'Ivoire, the Strategic Support for Scientific Research Programmes in Côte d'Ivoire (PASRES) was created in 2007 with funds from the Ivorian-Swiss Fund



for Economic and Social Development (FISDES) (Gaillard & Van Lill, 2014). PASRES is made up of three units – a decision-making body (Steering Committee), an advisory body (Scientific Council), and an implementing agency (Executive Secretariat) headed by an Executive Secretary. PASRES is mostly funded by foreign donors; however, the government of Côte d'Ivoire, through its national higher education and research institutions, provides some funding. Gaillard and Van Lill (2014) report that funds made available by government made a marginal contribution to research activities; nonetheless, our findings indicate that government is showing more concern for research and is making more funding available for it.

In the case of Zambia, the National Science and Technology Council (NSTC) was established in 1997, inaugurated in 1999, and has been operational since 2000. The NSTC coordinates the facilitation of science research for national development (Sheikheldin, 2018). The Council has also actively prioritised facilitation of research projects focusing on health, environment and food security in order to enhance the science and technology capacity of the nation. Several research institutes, funding organisations, and SGCI member countries have partnered with the NSTC, including the NRF, the University of Zambia, the Zambia Information and Communications Technology Authority, and the Zambia Agriculture Research Institute (Sheikheldin, 2018). Collaborations with South Africa, Mozambique, Malawi, Rwanda, Uganda and Germany have also resulted from inputs by the SGCI. However, Ozor et al. (2020) report that there is need for better cooperative relationships with the private sector to improve collaborations.

Similar trends as in the case of Côte d'Ivoire have been noted in Kenya, where the government has established three STI agencies to facilitate research for national and regional development. The National Commission for Science and Technology Innovation (NACOSTI), the NRF (which functions as the Kenyan SGC) and the Kenya National Innovation Agency (KeNIA) were established in 2013 with the mandate of facilitating, promoting and coordinating science and technology innovations in the nation (Khaemba, 2018b). Since the establishment of these agencies, there has been growing investment in research by the country and various partnerships have been formed with private organisations and agencies. In fact, Kenya has partnered with seven other SGCI member countries on science research projects (Khaemba, 2018b). However, findings by Ozor

et al. (2020) indicate that private institutions still find it difficult to partner with public institutions in the country. Nonetheless, reports from SGCI member countries indicate a growing trend of investments in science-based research for national and regional economic development, although the rate of and interest in investment vary across nations. The national progress being made in scientific research within member countries of the SGCI must, however, be leveraged and expanded on for the purpose of regional and continental development.

8 Methodology

This study adopted a qualitative research model using a phenomenological case study approach. A phenomenological approach explores an issue based on the everyday knowledge and perceptions of specific respondent subgroups (Lindgren & Kehoe, 1981). Qualitative research is unique in that it enables the collection of culturally specific information about the values, opinions, behaviours and social context of a particular population. Therefore, what distinguishes the qualitative research method from other research methods is the opportunity to do an in-depth study and analysis by obtaining first-hand information from respondents.

Primary data was collected qualitatively using key informant interviews. Informants interviewed were selected purposively from amongst SGC staff and governing board members in four African states – namely, Botswana and Zambia in Southern Africa, Côte d'Ivoire in West Africa and Kenya in East Africa. These countries were selected to represent the three SGCI regions and include a mixed sample of both independent SGCs and one located within a government department. South Africa is included in some instances as a benchmark, especially for a comparative analysis. Table 1 shows the SGCs that formed part of this study and the number (as well as designation) of the participants from each that were interviewed.

Data collection faced various challenges due to the COVID-19 pandemic. The first challenge was establishing contact with the original six SGCs selected for the study. Since we could not achieve that, we decided to work with the four that we got responses from. The second challenge related to identifying a sufficient number of officials and policy-makers to interview, as

**TABLE 1 SCIENCE GRANTING COUNCILS IN FOUR CASE STUDY COUNTRIES AND INTERVIEWEES FROM EACH**

Name of council	Country	Status	Year established	Number of interviewees and designation
The Department of Research, Science and Technology (DRST)	Botswana	Non-independent	2004	4 (Director, Deputy Permanent Secretary, Chief Research Science and Technology Officer, Principal Science and Technology Officer)
Strategic Support for Scientific Research Programme (PASRES)	Côte d'Ivoire	Independent	2007	3 (CEO, member of the Administrative Board and Communication Manager)
The National Research Fund (NRF)	Kenya	Independent	2013	1 (CEO)
The National Science and Technology Council (NSTC)	Zambia	Independent	1997	1 (Ag. CEO)

Source: Compiled by authors

they were facing internal challenges trying to cope with the pandemic. The main contact people in each country made several attempts to set up appointments for us with the policy-makers and board members, but their efforts did not yield the number of participants we had hoped for. Furthermore, the researchers could not travel to the selected countries to interact with the SGC officials and observe modes of operation. However, as an alternative, online interviews were scheduled with them via Zoom. Where necessary, follow-up questions were sent via email.

The sample of key informants interviewed included three CEOs, one Director, two members of the Administrative Board, and three administrative staff. This sample included four females and five males.

9 Limitations of the study

The study was designed with the goal of talking to more policy-makers and members of the SGC governing boards than were ultimately recruited to participate. We had anticipated that it would be challenging to talk to policy-makers; however, due to disruptions related to the COVID-19 pandemic, the challenges were significantly exacerbated. Appointments were repeatedly cancelled as officials sought to address more pressing issues. We had also hoped to interview more members of the SGC staff and boards, but executive management working closely with them struggled to secure appointments for us – especially via Zoom. It is our belief that

had we been able to visit the countries physically, the interview process would have been easier. This was confirmed by one member of the executive management who guaranteed us access if we were to visit in person. However, travel restrictions prevented us from making any in-person visits to the case study countries.

10 Findings and recommendations

The findings from this study covered areas such as how SGCs are structured, organised and funded; what evidence there is of progress being made towards linking research to development agendas, innovation, and valorisation of research products; partnering with the private sector; and ways to unlock more funding for research. Since the study took place during the pandemic, we added a component of understanding the challenges SGCs were facing during the pandemic period and how they have managed to develop coping strategies to be shared with others. We conclude the report with some specific recommendations.

10.1 SGC structures

African governments have, through the African Union, established AUDA-NEPAD as a development agency to coordinate and execute priority regional development projects.⁶ This is a structure operating at a regional level, while SGCs operate at a national level, thus a lot of coordination is needed. The SGCs serve

6 <https://www.nepad.org/who-we-are/about-us>



as intermediary agencies between governments and research institutions. Currently, the SGCs are at different development stages in terms of them operating as independent agencies or being located within a government ministry. Of the four countries chosen for the study, Kenya, Zambia and Côte d'Ivoire have well-established SGCs, while Botswana operates as part of the Ministry of Tertiary Education, Research, Science and Technology. Table 2 compares the similarities and differences that exist amongst the governance structures and functions of the four SGCs in this study.

10.1.1 Science granting council in Botswana

Botswana is the only country included where SGC functions are performed by a government department located in the Ministry of Tertiary Education, Research, Science and Technology – namely, the DRST (see Table 2). We have classified the DRST as a non-autonomous agency, as it functions as an extended arm of government supporting research activities, dispersing research funds and ensuring that government research priorities are addressed. The Department has a mandate to create a conducive environment for research and innovation to take place and to coordinate STI activities. This is done primarily through the development of research, science, technology and innovation (RSTI) policies, development of policy instruments, as well as initiatives to engage the public and engage

other stakeholders in RSTI. Furthermore, the DRST is responsible for capacity building and promoting the inclusion of women in research. In terms of structure, the Department reports to their parent ministry and is headed by a Director who reports to the Deputy Permanent Secretary (DPS) in the Ministry; the DPS reports to the Permanent Secretary (PS).

The core of the DRST consists of about 10 personnel, including the Director and Deputy Director. It is divided into two divisions headed by Chief Research and Technology Officers. As shown in Figure 1, the first division is charged with the responsibility of coordination and development, while the other is charged with responsibilities related to Policy and Legislation.

Each division is headed by a Chief Research and Technology officer. The first division is composed of three core units – namely, M&E, Database Management, and Science, Information and Technology. The second division is composed of Policy Development and Legislation, Forecasting and Planning, and Intellectual Property Protection. The three units in each of the two divisions function as a single unit, with only one staff member overseeing the affairs of each. Other administrative staff members are responsible for finances, human resources, transport and operations.

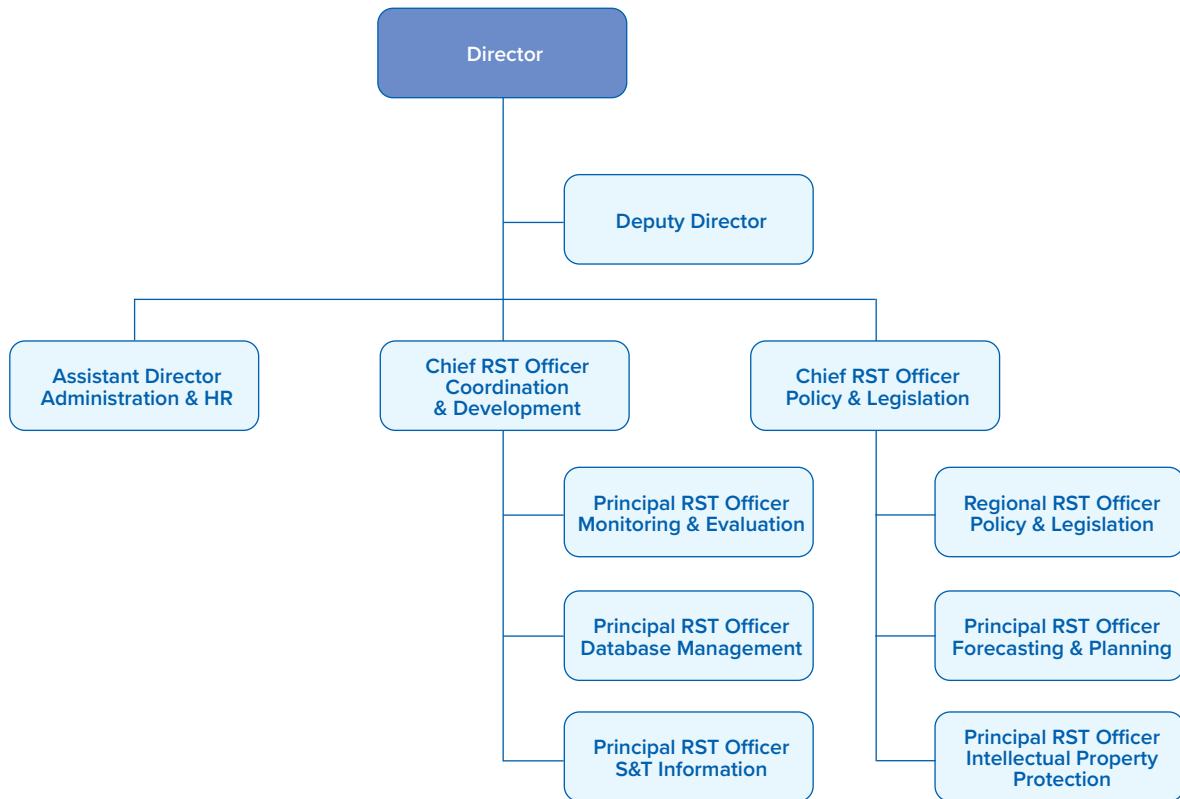
TABLE 2 GOVERNANCE STRUCTURES OF THE SGCs IN BOTSWANA, CÔTE D'IVOIRE, KENYA AND ZAMBIA

Science Granting Council	Ministry	Functions	Divisions/Units	Coordination
BOTSWANA The Department of Research, Science and Technology (DRST)	Ministry of Tertiary Education, Research, Science and Technology	Coordinates research, technology and innovation in Botswana.	Two units: Coordination and Development Unit and Monitoring and Evaluation (M&E) Unit. Both units headed by Chief Research and Technology Officers.	Headed by a Director who reports to the Deputy Permanent Secretary (DPS) in the Ministry. The DPS reports to the Chair or Permanent Secretary (PS) of the Ministry. The PS reports to Cabinet or to the Minister (who reports to Cabinet).
CÔTE D'IVOIRE Strategic Support for Scientific Research Programme (PASRES)	Ministry of Higher Education and Scientific Research	Coordinates all research and innovation activities in the country.	Three units: Steering Committee, Scientific Council, and Executive Secretariat.	Headed by an Executive Secretary who oversees the activities of the three units.
KENYA The National Research Fund (NRF)	Ministry of Education, Science and Technology	Supports the advancement of scientific research, inventions and innovations and the building of capacity in STI. Provides funds for policy-oriented research as determined in the government development targets – the Big Four Agenda.	One of three institutions established through the STI Act of 2013: NACOSTI, NRF, and KeNIA.	NACOSTI, NRF and KeNIA are each headed by a CEO. The three work hand-in-hand in the performance of their unique duties. Representatives of each of the three institutions sit on each other's boards and they all have a say in the formulation and implementation of research activities
ZAMBIA The National Science and Technology Council (NSTC)	Ministry of Technology and Science	Statutory mandate: promote STI for improved quality of life in Zambia. This mandate is fulfilled through four functional pillars: (i) promotion and advocacy, (ii) regulation and coordination, (iii) resource mobilisation and disbursement, and (iv) policy advising.	Divided into Programme Development and Implementation and second, Administration and Finance.	The Council is headed by a Chairperson who is the administrative head of the NSTC. The CEO (Head of Secretariat) reports to the Council, which in turn reports to the Minister as provided for in the Act. The CEO also has regular interactions with officials from the Ministry.

Source: Compiled by authors



FIGURE 1 ORGANISATIONAL STRUCTURE OF THE DEPARTMENT OF RESEARCH, SCIENCE AND TECHNOLOGY (DRST), BOTSWANA



Source: DRST Botswana 2021 (As provided by DRST)

There are challenges with the coordination activities, as different ministries continue to report through their own channels. Botswana is in a transitional phase, with ongoing discussions regarding the establishment of a research fund and the transformation of the current research-related government structures such that they are positioned under one directorate. The National Policy on Research, Science, Technology and Innovation proposes that a Botswana National Research, Development, and Innovation Coordinating Council be established to advise the leadership of the country and coordinate decision-making on RSTI issues. This Council will be established by statute and function as an autonomous body chaired by the Minister responsible for Science and Technology. This Council is yet to be established.

There are several other committees that have been constituted to facilitate coordination and interactions between the DRST and research units in other ministries. One of these is the Zonal Joint Committee, which serves as a platform for discussing progress within

national and regional research projects in the country. An M&E framework, which was adopted after consultations with a broad range of stakeholder, was developed to strengthen coordination efforts in the country.

Another entity is the Botswana Joint Committee (BJC) on Science and Technology – initially established to manage its relationship with primarily South Africa. Over time, the BJC has been commissioned to also coordinate activities that are science and technology related amongst different institutions within the country. It is composed of representatives from various ministries and organisations and chaired by the DPS for the Ministry of Tertiary Education, Research, Science and Technology. The BJC holds meetings quarterly, where reports and updates on ongoing projects are shared, challenges discussed and solutions jointly developed. Whatever is decided at this level is reported to the ministries, which then report to the national government.

In the course of the present study, the DPS acknowledged in one of our meetings that Botswana has



benefitted from participating in the SGCI and that it has helped them with their capacity-building efforts. It was further stated that the DRST has gained more knowledge on the operation of an independent SGC. As part of the steps towards the establishment of an independent SGC, Botswana has been studying other models and structures such as the South African NRF and the African Academy of Sciences. The latter operates on a lean but effective structure, which is of particular interest to the DRST.

10.1.2 Science granting council in Côte d'Ivoire

Côte d'Ivoire has an independent SGC – *Programme d'Appui Stratégique a la Recherche Scientifique* (Strategic Support for Scientific Research Programme) or PASRES. It was established after Côte d'Ivoire and Switzerland signed a scientific cooperation agreement in 2006. As shown in Table 2, PASRES consists of three bodies: the Steering Committee, the Scientific Council, and the Executive Secretariat. The Steering Committee is the apex body of the organisation, giving direction to the other two in terms of priorities at both the sub-regional (e.g., Economic Community of West African States) and national levels. The Steering Committee interacts with the political community,

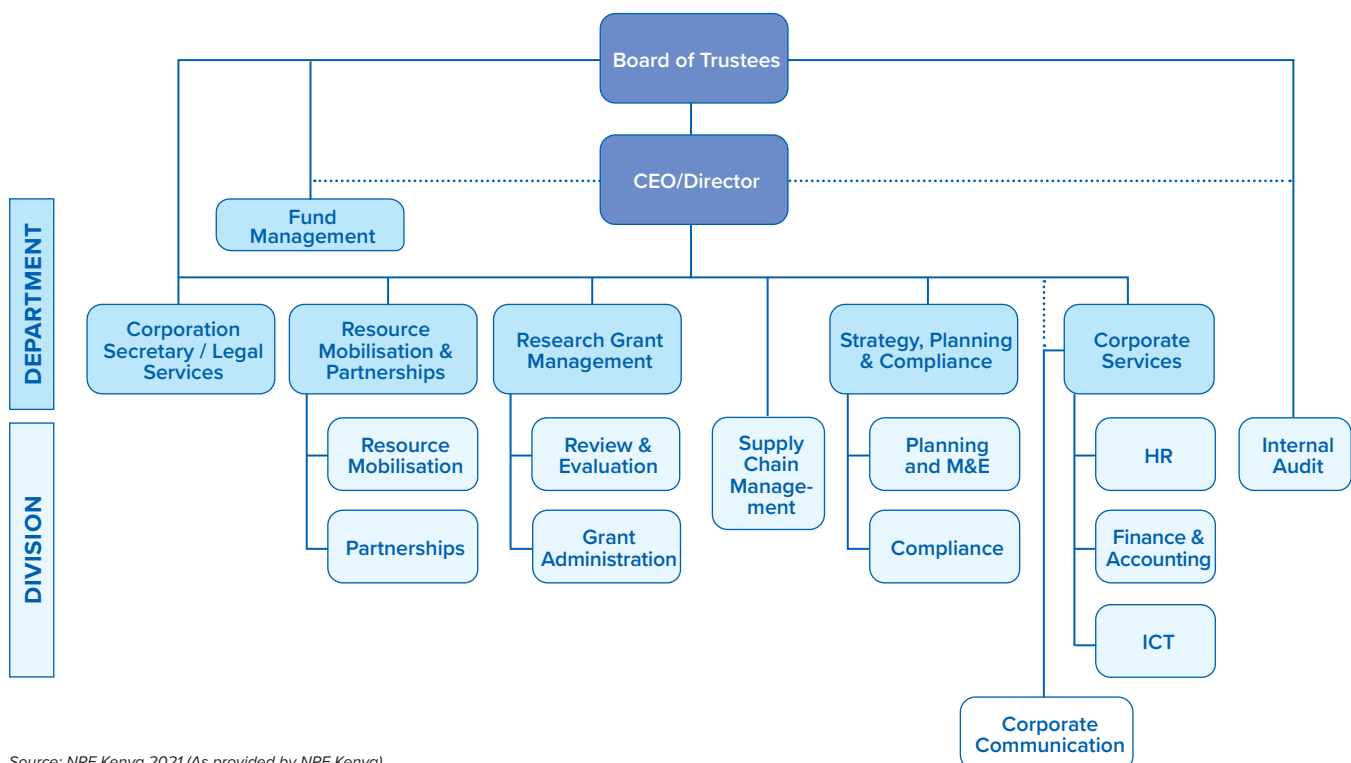
policy-makers, and private sector, and it is composed of representatives from the Ministry of Higher Education and Scientific Research as well as the private sector. The participation of the private sector is key, given that many governments in Africa cannot adequately provide the resources for scientific research and innovation. This is why Côte d'Ivoire sees the private sector as important to the mobilisation of funding for scientific research.

The Scientific Council mobilises the national scientific community and legitimises PASRES' mission in the country, while the Executive Secretariat (headed by the Executive Secretary) oversees the activities of all three bodies under PASRES.

10.1.3 Science granting council in Kenya

In Kenya, the National Science and Technology Innovation Centre (NSTIC) was established under the National Science, Technology and Innovation Act of 2013. The NSTIC consists of three institutions – namely, NACOSTI, the NRF and KeNIA. As shown in Figure 2, the NRF is the SGC and the agency that provides funding for research. As is the case with Côte d'Ivoire and Zambia, the Kenyan NRF is an independent SGC.

FIGURE 2 ORGANISATIONAL STRUCTURE OF THE NATIONAL RESEARCH FUND (NRF), KENYA



Source: NRF Kenya 2021 (As provided by NRF Kenya)

The Kenyan government has a development agenda that focuses on four major areas – namely, food security, health, manufacturing, and housing. The overarching goals to be achieved in these areas are commonly referred to as the “Big Four”, and the three institutions of the NSTIC prioritise projects that fall under the Big Four agenda. With regard to main responsibilities, NACOSTI plays a regulatory role, the NRF deals with facilitation of research, and KeNIA focuses on translation of evidence into practice. NACOSTI plays an overseeing role, deciding the research priorities that must be carried out by NRF and KeNIA. NACOSTI sets the research priorities and obtains inputs from wider stakeholders (including the NRF and KeNIA) before the validation research products for use. KeNIA ensures that research findings are commercialised so as to yield value and support socio-economic development. The three institutions participate in one another’s boards, giving inputs on formulation and implementation processes, and the CEOs have voting rights in all three institutions. Public funds are used for research that falls within national objectives, while funding from other sources can be used for research beyond the national objectives but which must have the potential to contribute to the socio-economic development of the country.

10.1.4 Science granting council in Zambia

The SGC in Zambia is the National Science and Technology Council (NSTC), which was established under the Science and Technology Act of 1997. The Council has 13 members drawn from different areas of the science system such as industry, academia, business enterprises and research institutions. The structure of the NSTC is illustrated in Figure 3. The NSTC is linked to the Ministry of Education, which oversees universities and research institutions, and as such reports to the Minister of Education. At the time that this study was conducted, the portfolio of the Minister for Science and Technology rested within the Ministry of Education.

The Director of Science and Technology, who represents the interest of the Ministry of Education, sits on the NSTC Board. The Board also reports to the Minister. The Board has committees that handle technical issues for the Board – one of which is the Science Technology and Technical Committee. The

CEO of the NSTC, who is also the manager responsible for STI activities of the Council, reports to the Science Technology and Technical Committee. Furthermore, the CEO of the Council serves as Secretary of the Council, while another person serves as the Secretary of the Technical Committee. At the time the study was conducted, the NSTC was yet to be constituted by the Minister of Education, who was serving as acting CEO and performing the dual roles of Secretary of the Board and of the Council. Attempts were made to get an update on these positions, however, due to busy schedules of concerned officers, the needed information was not provided.

Summary

In the course of our interviews, Kenya mentioned that they operate on lean but efficient human capacity, with the NRF having only three technical officers. In Zambia, there were only 13 NSTC personnel, while the number of PASRES staff in Côte d’Ivoire could not be determined. Interestingly, in Botswana – the only country in the study without an independent SGC – the DRST seemed to require far greater human resource capacity to manage, with 33 staff members (core and support/admin staff).

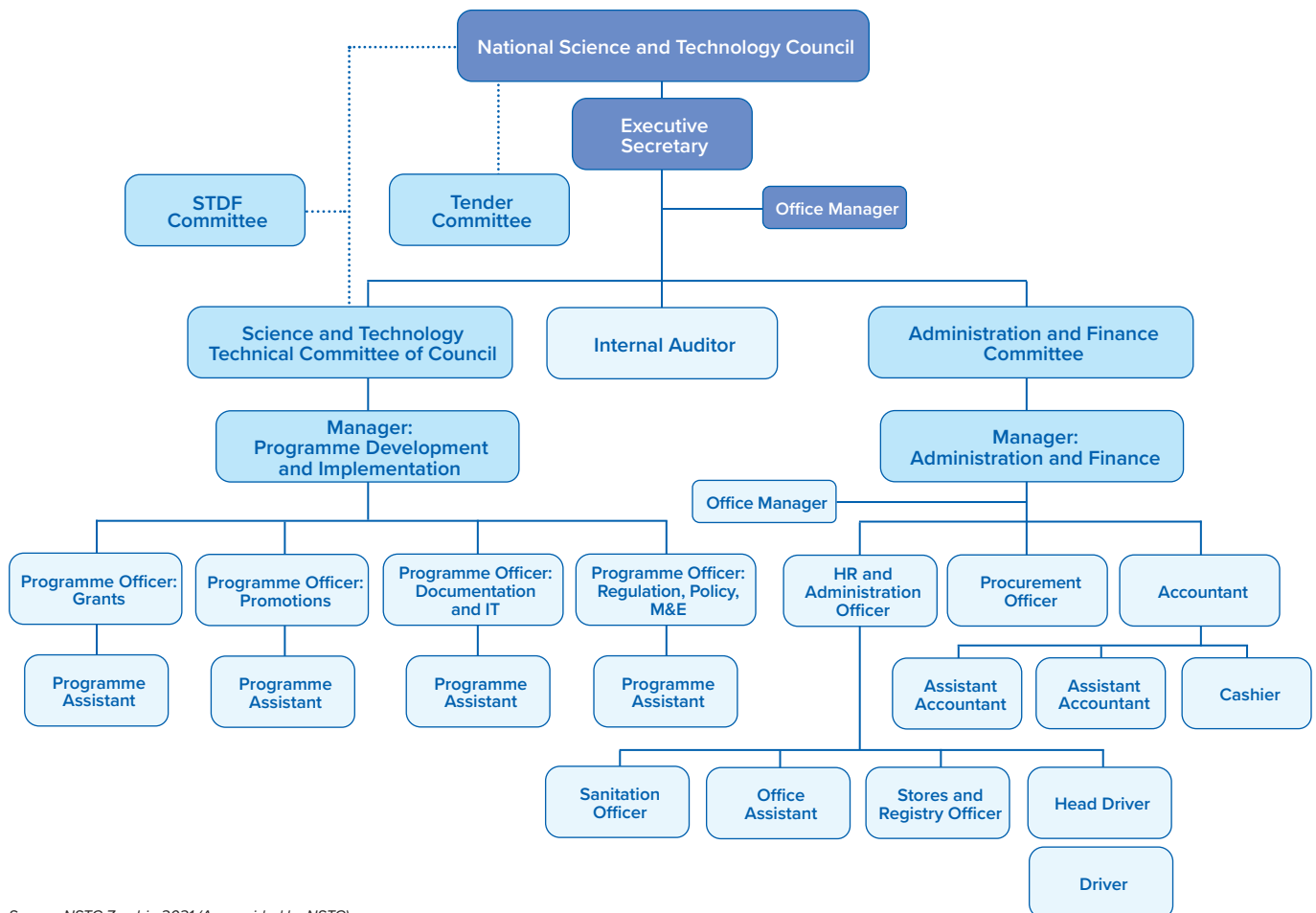
We recommend that governments work towards establishing independent SGCs that operate with lean structures to save resources that can be used for research activities. This is one way to reduce the cost of running these institutions and make more funds available for research purposes.

10.2 Funding for research

As noted earlier, funding, which is an essential lifeline for research and innovation, is minimal in Africa. The main reason is that there are major competing national needs requiring funding, making it difficult for governments to meet the expectation and commitment to fund R&D at the level of 1% of their GDP. However, some progress has been made towards reaching the target, as illustrated in Table 3. The table compares data on government allocation of GDP to education, higher education and research during different years (where available) for the four African states used as



FIGURE 3: ORGANISATIONAL STRUCTURE OF THE NATIONAL SCIENCE AND TECHNOLOGY COUNCIL (NSTC), ZAMBIA



Source: NSTC Zambia 2021 (As provided by NSTC)

cases in this study. These statistics were extracted from the World Bank database^{7,8,9,10}, other sources^{11,12,13} and interviews.

TABLE 3 % GDP ALLOCATED TO DIFFERENT SECTORS

Country	Education (%)	Higher education (%)	Research (%)
Botswana	9.6% (2009)	42% (2009)	0.54% (2013)
Côte d'Ivoire	5.1% (2017) 15.1 (2020)	14% (2018)	0.09% (2016) 0.37% (2021)
Kenya	5.3% (2015/2017) 19.0% (2018)	13.1% (2015)	0.786% (2010) 0.80% (2021)
Zambia	1.1% (2008) 12.4% (2020)	26% (2005)	0.28% (2008) 0.60% (2021)
South Africa	6.5% (2019) 19.5% (2020)	15% (2018)	0.83% (2017)

Source: Compiled by authors

Table 3 reveals a slight increase over time in the allocation of GDP to research in Zambia, Kenya and Côte d'Ivoire. The SGC in Botswana does not get allocated research funds because its role is mainly coordination and development as well as M&E. Research funds are channelled via different ministries, including the Ministry of Science and Education, which allocates grants to universities and other research entities: "So, we do not have a central research fund like other countries" (Botswanan official). Research funding levels in Botswana remain low, with the highest recorded percentage of GDP being 0.5% in 2013. There is great reliance on external funding by higher education researchers, and such funding is not always aligned to the top priorities of the country or its immediate challenges (Botswanan official).

7 <https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS?locations=UG&view=chart>

8 <https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS>

9 <https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations=ZA>

10 <https://data.worldbank.org/indicator/SE.XPD.TOTL.GB.ZS?locations=ZG>

11 <https://www.ceicdata.com/en/kenya/education-statistics/ke-government-expenditure-on-education-total--of-gdp>

12 <https://www.ceicdata.com/en/kenya/technology/ke-research-and-development-expenditure--of-gdp>

13 <https://knoema.com/atlas/Kenya/topics/Education/Expenditures-on-Education/Expenditure-in-tertiary-education>

During the interviews, it was mentioned that the NRF in Kenya aims to secure adequate funding for research in the country, with the target being to utilise 2% of GDP to fund research. If Kenya were to reach this target, it would be a good prototype and useful example for other African states. The 2% target for funding in Kenya is expected to be reached with support from other sources such as private sector development partners and philanthropists. From an R&D survey conducted in 2020, 0.8% of Kenya's GDP (equivalent to about US\$80 billion) currently goes to research. Government's contribution since the inception of Kenya's NRF has been between 0.03–0.003%; the rest is provided by development partners and the private sector (Kenyan official). It is to be noted that in Kenya, while government's revenue was declining due to the negative impact of the pandemic on companies and industries, government still prioritised provision of funds needed for research and to cover the operational costs of the NRF.

Côte d'Ivoire has set its target at 1% of GDP, but currently its research funding level remains at 0.37%. In Zambia, the target is also set at 1%, but research is funded at a lower rate of 0.6% of GDP. However, the NSTC presents their annual budget to the government at the end of every calendar year and, so far, they have been fortunate enough in some years to get their budget request fully funded. This has been the case in 2017 and 2020. In 2018, they received 75% of their budget request and 80% % in 2019. Officials indicated they were grateful that their funding levels never dropped below 70% of their requested budget.

Summary

A major problem identified in the funding of research is that most politicians expect research products to be tangible and immediately usable for them to justify the funding of research. This is a challenge because the path from inception to products and services is not a smooth and linear one. To address this issue, it is important for SGCs and other agencies to find mechanisms to valorise and commercialise research products. In the case of Kenya, an agency such as KeNIA has been charged with this responsibility. The points raised in the following section on linking research to development agendas are also potential ways of unlocking more research funds.

10.3 Research links to development agendas

From the literature review, it is evident that research needs to inform policy for the advancement of the development agenda. In the Global North, this seems to be the case more often than in the Global South. However, this study found evidence that this may be changing. A case in point is Botswana, where there is an increase in the number of scholars and academics joining politics (Botswanan official). There is an expectation that they will bring their research skills into policy-making processes – a topic worth exploring in greater depth in the future.

In this study, there were many references made to research priorities being informed not only by national development plans but also regional and continental development agendas. For instance, the Steering Committee of PASRES gives direction to the other two units within the organisation (Scientific Council and Executive Secretariat) in terms of priorities at the sub-regional level (e.g., those set by the Economic Community of West African States) as well as national level. For Kenya, the representative in the study said the following: “We are addressing our bigger Vision 2030. We are also addressing the SDGs [sustainable development goals] and of course the African Union Agenda 2063. Our country has a stake in contributing towards continental, and global priorities.”

In Zambia, the NSTC developed a five-year strategic plan guided by the 7 National Development Plan (7NPP) and the Vision 2030. “This 7NPP and Vision 2030 aim to develop a country driven by science, technology, and innovation” (Zambian official). The official further noted that the Council has a responsibility to domesticate the 7NPP and Vision 2030 through the strategic plan. It must also take into consideration the Science and Technology Policy, which was reviewed and relaunched in December 2020. Currently, there is a draft of the national research agenda, which clearly indicates all the national priorities in terms of research. According to the same official, the agenda is before the parliament for approval. Once approved, it becomes an official guiding document for different role players in the implementation process. Efforts to get an update on the approval process did not yield any positive results.



In the three countries with independent SGCs, there seems to be more coordination in setting research priorities and aligning them to national government agendas. In Côte d'Ivoire, scientific research priorities are set by the Scientific Council. For Kenya, the government has set four major national objectives – namely, food security, universal health coverage, manufacturing, and housing – which frame the research priorities. The National Science, Technology, and Innovation Act 2013 enabled the establishment of agencies that support the pursuit of these priorities. In the case of Zambia, the NSTC sets priorities and outlines them in their five-year strategic plan, which is informed by the government's development agenda. However, in Botswana, in the absence of an independent SGC, different ministries set their own priorities and use their own funds to support research. According to a Botswanan official, “when it comes to priorities, to start with, we have a national development plan so the ministries get their priorities out of the national development plans”. The BJC coordinates these various efforts.

Summary

There is evidence that research priorities in the case study countries are aligned to national development agendas; however, there is no evidence that the research outputs are used to *advance* the development agenda. To address this issue, we make three recommendations.

The first is that deliberate efforts be made ensure that research outputs reach end users – for example, farmers producing food.

The second recommendation is that SGCs encourage researchers to co-generate knowledge with communities by forming partnerships with community organisations in the field that their research targets.

The third is to deliberately prioritise and pursue the informing of policy by research. This can be achieved through SGCs organising policy dialogues and engagements between policy-makers, researchers and the broader community. Such dialogues will create a platform for making research outcomes more accessible and usable than when they are merely disseminated through scholarly publications and papers presented at conferences. It must be acknowledged that implementing these recommendations requires additional financial and human resources.

The four frames of action proposed by St John (2013) – discussed in Section 5 (Challenges Associated with Research-Based Policy) – provide a useful framework for how best to structure and utilise both qualitative and quantitative research to inform policy. With reference to the above recommendations, we particularly advise the use of the communicative frame, whereby government agencies and researchers collaborate with one another to find new ways to address challenges using a mixed-methods research approach.

10.4 Innovation and valorisation of research products for policy impact

Two challenges were identified during the study as barriers to funding research at a higher level. The first is that governments and society at large sometimes do not see the direct value of research. The second issue relates to the continuing tension between using research funds for applied rather than for basic research,¹⁴ as opposed to valuing and supporting both types of research. Funding basic research is, unfortunately, perceived as funding academic interests that do not necessarily benefit society. This perception is illustrated by the following statement:

The only thing that people are doing is that they are researching so they can get promoted but that is not what the government is interested in. We are interested in products and services that can be channelled in the economy to improve the lives of the people. (Botswanan official)

This resonates with Chataway et al.'s (2019) study that calls into question knowledge transfer for societal benefit in Africa. With the continent lagging behind on development indices, there is increased emphasis on directly involving science and technology in pursuit of the innovation required to drive development. Accordingly, the African Union has established the African Union Science, Technology, and Innovation Strategy for Africa (STISA) of 2014. The Strategy sets

14 “Basic (aka fundamental or pure) research is driven by a scientist's curiosity or interest in a scientific question. The main motivation is to expand man's knowledge, not to create or invent something. There is no obvious commercial value to the discoveries that result from basic research. ... Applied research is designed to solve practical problems of the modern world, rather than to acquire knowledge for knowledge's sake. One might say that the goal of the applied scientist is to improve the human condition” (Lawrence Berkeley National Laboratory, n.d.). <https://www.sjsu.edu/people/fred.prochaska/courses/ScWk170/s0/Basic-vs.-Applied-Research.pdf>



out a 10-year plan for the continent to mainstream science and technology into plans for Africa to achieve the 2030 UN SDGs (Chataway et al., 2019).

A point that was raised on several occasions by the leadership of the SGCs is that many researchers in academic institutions are only interested in research that would lead to publications and promotion, and not research that contributes to development in their countries. Uganda's Minister for Science, Technology and Innovation, Dr Monica Musenero, affirmed this sentiment: "In Africa a lot of us do research with the aim of publishing in academic journals and so as to use such publishing to earn ourselves promotions at work" (Waruru, 2021, p. 1). Musenero's statement reflects a widely held perception – as evidence by views expressed at high-level fora such as the Seventh African Higher Education Week and the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) Triennial Conference in 2021. At this conference, some ministers held the view that African scientists only engage in research to produce knowledge with no clear benefit for the larger society. This again underscores "the message to the research community ... that impact-focused research work would compel governments to avail funding, as it would be helping the state make meaningful development strides" (Waruru, 2021, p. 1).

It thus remains challenging to persuade governments that contributing to development and producing research that leads to publications are not mutually exclusive. The leadership of the SGCs believes that it is such perceptions that are serving as a barrier to increased research funding. There was also mention of the need to utilise research products to inform policy and an expectation that researchers should make their research accessible by writing policy briefs based on their research. It was noted, however, that not many researchers are producing policy briefs.

Findings from our study show that Kenya and Zambia are intentional in overcoming the challenge of increasing research funding by proactively valorising research outcomes, and other countries are in the process of emulating this. To this end, KeNIA in Kenya has been tasked with valorising research outcomes, while the NSTC in Zambia is prioritising the identification of impactful research projects to fund. As noted earlier, we could not get an update on the latter, but the situation warrants monitoring to learn from their experiences.

An innovative strategy utilised by the NRF in Kenya to create a more positive perception and greater awareness of ongoing research was to produce a documentary on current projects that are in their final stages in order to showcase what has been done so far and to maintain a record of their success. According to an official, this documentary was useful in helping to identify projects that might need to be up scaled and financially supported. The CEO further noted that this has proved to be a productive way of presenting what has been achieved through research to the public, relevant authorities, stakeholders and partners for them to see and appreciate what research can contribute in terms of social impact and development.

Botswana is also making important strides in showcasing research results and technological innovations through its National Science Week, which attracts participants from different parts of the world. Furthermore, through the Botswana Innovation Hub, funds have been made available to develop technologies to deal with the COVID-19 pandemic. Researchers have, for example, been able to design innovative technologies for registering people for vaccination in easily accessible locations (e.g., parks, shopping centres and places of religious worship).

Another strategy adopted in Kenya was to identify decision-making bodies responsible for budgetary allocations and engage with them through dialogue. The NRF has directly approached the Parliamentary Committee in charge of education and research and engaged them in a dialogue that has yielded positive results. In addition, the NRF has developed a resource-mobilisation strategy that is meant to guide the sourcing of research funds available in Kenya. This strategy proposes several models that can be used in raising funds – for instance, a loan scheme providing start-up loans to people who have feasible proposals for business enterprises that would clearly benefit the broader society. An official noted that the NRF should soon move to the implementation phase of this scheme.

Botswana has started targeting some institutions and universities as drivers of innovation with the aim of supporting them as they partner with institutions from other countries. An example is the participation of the Botswana International University of Science and Technology (BIUST) in the Square Kilometre Array (SKA) project – an international partnership led by South Africa and Australia. When completed, the SKA



telescope will be the largest of its kind in the world (Teseletso, 2021). A site has been identified at BIUST for the SKA project, and preparations for developments are ongoing. To increase public awareness of such innovative projects, the DRST has launched a radio programme where researchers communicate in an accessible format what they are doing and what they have achieved so far.

Zambia is also proactively working on converting knowledge produced in universities and research centres into tangible products to be utilised for development. A Zambian official had the following to say in this regard:

Through the funds received from the IDRC in Canada, NSTC has launched a project called Knowledge Translation and Dissemination which aims at packaging all research documents into policy briefs that can be utilised by policy-makers in the areas of industry, gender dynamics, science and technology, development of extra drug resistant treatments to tuberculosis and many more. (Zambian official)

Unfortunately, we were unable to obtain additional information on the valorisation of research products or on strategies utilised to ensure the social impact of research conducted in Côte d'Ivoire.

An innovative strategy that could be explored and utilised by the research community in Africa is to pursue synergistic collaboration amongst African academics on the continent and in the diaspora in order to build a thriving research community that can generate new knowledge relevant to societal transformation. Such wider collaboration is what Ndunda and Maina (2021, p. 1) refer to as “creating an environment for intellectual capital remittance”. An example of an organisation that fosters these international relationships is the Carnegie African Diaspora Fellowship Program (CADFP), which funds African academics to spend time at universities in the US and Canada. The impact of such organisations can have lasting positive effects, with one Carnegie Corporation officer noting that “the CADFP collaborations have sparked innovation, created vibrant research communities, leveraged resources, generated new knowledge and increased research productivity” (UWN, 2021, p. 1).

Summary

The potential beneficial impact of research to society cannot be overemphasised. As has been noted earlier in the report, research products should be key drivers in policy-making processes in order to support societal development. Accordingly, SGCs need to continuously find innovative ways in which knowledge produced can be maximally utilised for the benefit of the people. The creation of the SGCI has been one significant development in advancing cooperation amongst SGCs so that they can more effectively share information and learn from one another. Furthermore, initiatives that support collaboration amongst African academics – both continent-wide and internationally – can be tremendously impactful in promoting better research with greater potential for impact on the African continent.

10.5 Public–private partnerships

The NRF in South Africa provides a model for other SGCs in terms of promoting public–private partnerships in research. They have developed the NRF–Industry Partnership Strategy (NRF, 2019), which focuses on supporting and promoting innovative research and human capacity development programmes that involve long-term partnerships between industry and research institutions. This Strategy aims to increase the NRF's responsiveness to industry needs, mobilise resources, and enhance joint programming that promotes social and economic development.

Other SGCs included in the study are also exploring ways to engage the private sector. For example, Botswana is starting to place greater emphasis on the involvement of the private sector in funding research, and they attribute this shift in focus to their participation in the SGCI – particularly the financial support they received during phase one of the SGCI.

So, we are really thankful to the SGCI because we are working on finalising a strategy aimed at engaging the private sector to participate meaningfully in research. So, that will really help the government ... We have also started involving the private sector in activities like our Science Week and the annual researchers' conference. (Botswanan official)



There was general acknowledgement that research activities carried out by the private sector and non-government agencies are likely to benefit society, and a partnership with them will contribute to addressing national needs. One challenge raised was that the private sector and industry in Botswana:

[Private companies] are predominantly subsidiaries of entities elsewhere, so you will find that research and development for those entities are done elsewhere and only what is deployed here are the services and the products that come out of that and the work. (Botswanan official)

It was also mentioned that diaspora researchers should be encouraged to participate in research that would benefit the country. This is an idea that needs to be explored further, as there are initiatives – mainly in the economic sector – that encourage the diaspora to contribute to development projects in Africa. An example of this is the African Diaspora Network, which raises capital from the African diaspora and friends of Africa to support development efforts. In the education sphere, there is the previously mentioned CADFP, which has awarded well over 500 fellowships to scholars from more than 160 universities in Africa to support research, curriculum development, and teaching activities (UWN, 2021).

In Kenya, strong public–private partnerships also exist, with the NRF providing funding for researchers in the private sector as well as academia. The private sector is represented on the NRF board, but there are still challenges in achieving more active participation from the private sector. Research focused on the Big Four priority areas (food security, universal health coverage, manufacturing, and housing) is often supported through public funds, while research in other areas generally has to rely on privately raised funds.

Another form of partnership that was highlighted by study participants is the partnership between SGCs in different countries. Examples include the partnership between Botswana and Zimbabwe, which has led to joint calls for research funded through the IDRC, as well as calls made by the South African NRF, which is leveraging funding from external funding agencies to support researchers in Botswana. It is to be noted that for the partnership between Botswana and Zimbabwe, each country contributes 15% to the research project funds. Currently, two research projects are ongoing, with the principal investigators coming from Botswana

and Zimbabwe. The Botswana Innovation Hub and the Research Council of Zimbabwe are collaborating to manage the projects. In addition, there are plans to create a research monitoring system that is externally funded and includes a database of research being conducted as well as mechanisms that would allow for the sharing of equipment. Great progress has been made in setting up this system, but at the time the study interviews were conducted, there were delays due to technical challenges faced by the DSRT. However, the Department envisages that the system will be complete by March 2022.

In Zambia, the SGC partners with the private sector by organising joint activities. According to an official,

Yearly, the Zambian Science Conference is organised and a central theme jointly developed with its partners. This initiative, which started in 2016, targets a particular industry every year, such as the agro-processing, live-stock, etc. (Zambian official)

This is their strategy to network and connect a wide range of industries under a single canopy. Another partner to the NSTC is the Zambian Association of Manufacturers (ZAAM). According to a Zambian official, this is an institution that focuses more on manufacturers, and it is in the interest of the Council to partner with them in order to, first, collect information on investment by private sector in their own research to generate value-added products and, second, to utilise ZAAM to attract other industries to begin to fund research. The Council is thus in the process of signing a memorandum of understanding with ZAAM.

The NSTC also strives to play the role of a facilitator by creating links between the industries, the knowledge generators, and the universities. The goal is to narrow the interaction gap amongst stakeholders that might negatively impact research outputs and limit the social impact of research. A Zambian official noted that in the quest to motivate industries to participate in partnerships with the NSTC, the Council plans to collect data on the industries' in-house investment in R&D. The goal is to find measures to introduce tax incentives for companies. The Act establishing the Council empowers it to make a case to government to give tax rebates to companies investing in research. The aim is to involve the private sector more and promote partnerships with them.



The situation in Côte d'Ivoire is similar. Based on the information collected, partnerships with the private sector exist and are valued. According to an official, “the private sector is seen as a close partner because the country’s economy depends on the sector, whose engagement is majorly in agriculture”. This is why PASRES is actively pursuing involvement by the private sector in order to maximise the benefits of these relationships and thereby expand the support base for research in Côte d'Ivoire.

Summary

An important strategy that could be adopted by the SGCs in this case study to encourage partnerships with the private sector is to offer incentives such as tax rebates. The SGCs in Kenya and Zambia are planning to utilise an approach in line with the system that operates in South Africa. The South African government offers the R&D Incentive, which was introduced into the Income Tax Act in 2006. Section 11D of the Act allows for a deduction equal to 150% of expenditure incurred directly for R&D. This incentive is designed to further encourage industry to undertake R&D (NRF, 2019).

10.6 Unlocking research funds

Aside from valorising research outcomes, there are other strategies being developed to unlock more research funds from a variety of sources. For example, Botswana is thinking of expanding its RSTI space by attracting more partners to join and participate in research. According to a Botswanan official, “in addition to funding, what I think is very critical is for us to grow our RSTI landscape ... I believe once we get that, every other thing, including funding, will fall in the right direction.”

Another strategy mentioned is that of bringing policy-makers into a dialogue on the benefits of research and how research products could be used to benefit society. A Botswanan official noted that research is an investment that may yield visible results within a short or longer period, and that the results might be usable immediately or not. The official argued that this understanding is needed on the part of policy-makers and can be achieved through open dialogue.

As noted in the preceding section, government incentives to the private sector would go a long way in unlocking more funds for research and innovation. As is

the practice in South Africa, where incentives are given in the form of tax reduction, Zambia and Kenya are in the process of adopting the same strategy. According to a Zambian official:

in the quest to motivating the industries, the Council is trying to collect their in-house investment on R&D. Given that the Act empowers the Council to initiate tax incentives, the Council can make a case for them before the government to give tax rebate. This is a move to draw the industries close and for them to open up more on what is it that they do. (Zambian official)

A Kenyan official noted that “an area where the NRF needs some assistance would be the area of resource mobilisation from the private sector. Soft skills are needed in this area to be able to approach them the best way.”

PASRES, which understands the role of the private sector and has an established partnership with the private sector since 2007, has not been able to consolidate that relationship. They hope to improve on this by learning from what other SGCs are doing. One official noted:

The private sector is key in that many governments in Africa cannot adequately provide the scientific research and innovation needs thus the need for partnership with them. This is why Côte d'Ivoire takes the private sector very important for the mobilisation of funding for scientific research in the country. (Côte d'Ivoire official)

From the government’s side, the research community has been advised that a change in research focus would not only produce knowledge that would benefit the society, but would motivate governments to make funding available for research (Waruru, 2021). Taking the argument further, Uganda’s Minister for Science, Technology, and Innovation, Dr Monica Musenero, noted that,

we need to challenge our academia to change their research models and start doing research that ends in a product out there in the market, or a business start-up. That is what happens in many countries that have relied on knowledge production to achieve development. (Waruru, 2021, p. 1)



The preceding indicates that, aside from pursuing partnerships with the private sector, the research community should look inwards and explore ways to garner additional government support.

Summary

If appealing incentives for funding research are introduced, there is a greater likelihood that the private sector would be willing to invest in R&D. However, caution should be exercised in ensuring that development agenda priorities are not redefined and skewed in the interests of investors only. In addition, a continued dialogue with policy-makers is essential to get the support needed for the funding of research.

In the following section, we discuss issues that emerged during the study that were not anticipated or included in the original study design.

10.7 Emergent issues

10.7.1 Equity and diversity

The concepts of equity and diversity were not originally included as part of the study; however, these issues emerged in some of the discussions with the participants. All the sampled SGCs take the issue of equity and diversity seriously, yet none of the SGCs has a specific policy document on this. Equity and diversity reflect marginally in some of the official documents and are to varying degrees taken into consideration in the allocation of funding to researchers. A case in point is Botswana. In discussions with an official it was mentioned that their research policy specifically supports women researchers. For example, there has been a strong focus on ensuring women get their PhDs. In one of the Botswana DRST training projects, women constituted 70% of participants. In addition, their projects target high school students to raise awareness of and promote science and technology career options; the goal is for participants to be represented in a ratio of three girls to one boy. As for other SGCs, we could not obtain any information in this regard.

Although SGC officials mentioned that they allocate funds with sensitivity to gender equity, it is important for SGCs to develop clear policy documents to describe policies related to equity and diversity and related implementation strategies.

10.7.2 Impact of COVID-19: Challenges, prioritisation and lessons learned

Globally, COVID-19 has changed the way individuals and organisations go about their daily activities. SGCs are no exception, and they have been affected in different ways. Many countries were forced into lockdown and implemented various other efforts with far-reaching impacts. As restrictions have eased, the world has had to adapt to what is widely termed “the new normal”. The section below covers the challenges, changes in prioritisation, and lesson learned relevant to SGCs during the pandemic that emerged during the study interviews.

i. Challenges

Due to a lack of infrastructure enabling them to effectively operate remotely, many SGCs were impacted negatively by the restrictions associated with the COVID-19 pandemic. It was reported that some of the officials and researchers had difficulties working from home, as they faced challenges such as inadequate connectivity and power outages. Consequently, in some instances, SGC officials had to take turns working at their offices, which slowed operations substantially. This was the case for all the four SGCs sampled for this study.

There were also challenges relating to the acquisition of the needed equipment, such as modems, which was not budgeted for and sometimes received push-back from finance departments or treasuries due to strict spending regulations. There were also costs related to home or mobile phone usage by officials – especially those charged with responsibilities to monitor and evaluate research. Special applications had to be made to allow funds to be used for those purposes.

In addition to technological challenges, it was mentioned that there was a slow-down of processes and decision-making in day-to-day operations due to staff sometimes being in isolation or quarantine.

South Africa had an additional and unique situation caused by frequently scheduled power outages (known as load shedding) that impacted work during the pandemic. The NRF has backup generators to continue its operations, but some of the researchers it funds were negatively impacted by load shedding.



ii. Research priorities and funding

The COVID-19 pandemic forced countries to revisit their research priorities and restructure their budgets to address emergent challenges:

There have been budget cuts in the original budgets that were allocated to some of the research organisations, which is quite disabling, because if we are having a [inaudible] like this and all, then we are taking from the researchers. (Botswanan representative)

This revision of priorities and funding allocation is not peculiar to the countries in this study. South Africa, which is seen as a model by some of the SGCs, was significantly affected – particularly when the Minister of Higher Education, Science and Innovation announced cuts to its science and innovation budget as the country adjusted its spending priorities to focus on the containment of COVID-19 (Space in Africa, 2020). This led to the launch of different programmes by the NRF aimed at mobilising and supporting the scientific community to find local solutions to mitigate the impact of the pandemic.

The Botswana Innovation Hub allocated funds through the Botswana Innovation Fund for COVID-19-related projects. The positive outcome of this is that, in a short period of time, different technologies were developed for use in the management of the COVID-19 pandemic. Botswana also reported the emergence of various new local technologies. An example is the development of applications that assisted in registration for vaccinations in shopping centres, religious centres and buses. There were also tools developed for easy contact tracing. Thus, while COVID-19 had its negative effects, it also spurred nations such as Botswana to develop its own technologies to address challenges. Many of these local technologies will remain useful post-COVID-19.

In terms of funding research in response to COVID-19, Botswana has, however, not done as well as on the technological front. Researchers have not been well funded by the DRST for COVID-19-related studies, and those institutions using their own funds to support such projects have limited resources to do so. This has impeded researchers' efforts to utilise indigenous knowledge systems to create local solutions.

In Côte d'Ivoire, where government prioritises research that impacts lives positively, the Minister for Higher Education Scientific Research approved the

mobilisation of the scientific community to assist the government at the start of the COVID-19 pandemic in March 2020. The aim was to put local knowledge to use to identify the COVID-19 virus strain that first entered the country and to find local solutions to curb or cure the virus. It was also important to know how to communicate effectively with the public regarding safety measures such as social distancing, given that Africans generally tend to live a more communal lifestyle. Solutions from the Global North involved mitigation measures that included isolation if symptomatic and avoidance of social gatherings to prevent spread of the virus. According to a Côte d'Ivoire official, these practices are contrary to social norms in African cultures, where family and friends tend to gather to support the ill or bereaved. Communicating and motivating the public to follow recommended safety measures was thus a big challenge for the health sector in Côte d'Ivoire which needed urgent solutions. Half of PASRES' funds were re-allocated to launch a special call in that regard. In addition to this, more funding was received after strategic lobbying by the Executive Secretary. The research community responded positively and proposed workable solutions to address the challenges faced by the health sector. According to a representative:

This project was a huge success as scientists from the health sciences were mobilised to carry out scientific study, and researchers from the social science and humanities were also mobilised to address how to effectively communicate to the people in the light of long-existed cultural values which negates what the situation demands from the people were mobilised. (Côte d'Ivoire official)

The implementation of these solutions has begun and, according to the SGC, has yielded impressive results thus far.

The NRF in Kenya launched strategic calls for research on COVID-19 as well as two other major areas of concern – namely, cancer and locust invasion. The calls were processed and, due to financial constraints, funding was allocated on a priority basis. According to a Kenyan official, resources were allocated to a consortium to address COVID-19 research in four thematic areas: (i) biotechnology research and clinical trials as well as drug development and trials, (ii) psychosocial health, (iii) public health, and (iv) COVID-19 prevention. It was also reported that newly identified research areas linked to the Big Four priorities before the COVID-19

pandemic were paused so that research on the COVID-19-related challenges could be funded, and research funds have been re-allocated accordingly. There are many new information and communication technology interventions/solutions related to COVID-19 challenges documented. These include, amongst other interventions, the automation of various processes which were previously implemented manually.

Unlike Côte d'Ivoire, where additional funds were allocated, no additional funding was initially allocated in Kenya, but priorities were re-organised. However, after negotiations with the relevant authorities, the NRF anticipates that additional funding will be made available as budgets are reviewed and adjusted to address urgent priorities. Specific dates for these review processes were not provided. COVID-19 has interrupted many programmes and ongoing research projects. The organisation is yet to get actual reports on which programmes were affected in Kenya. However, the NRF aims to use this report as a basis for promoting policy that would recognise researchers as essential workers. The pandemic has exposed this lacuna and revealed the need to add researchers to the list of essential workers when there is a public health crisis of this nature.

Zambia's NSTC also launched an emergency call for COVID-19-related research in 2020. We were unable to find more information as to progress made in this regard.

Overall, the interviewees confirmed that there were various positive outcomes as countries were pushed to develop technological solutions to the challenges posed by COVID-19.

iii. Lessons learned

One common feature that emerged from the study discussions related to the COVID-19 pandemic is the emergence of interventions and lessons that have permanently changed the SGCs' modes of operation moving forward. The first lesson learned during the crisis was that these institutions can continue to operate with fewer personnel, as long as they have the technological infrastructure. A case in point is Botswana, where the DRST had been contemplating operating with a leaner structure. The Department is currently working towards relying more on technology support for operations than having many people operate a manual system. The plan is to learn from peers such as the NRF South Africa, the African Academy of Sciences,

and global networks of evaluators and experts to establish a system of experts who will evaluate proposals when calls are put out.

The second lesson relates to the importance of investing in technological infrastructure – particularly online connectivity – for dealing with future crises and particularly to more effectively support remote operation. Botswana is making significant progress in this regard. The Ministry of Tertiary Education, Research, Science and Technology, through the DRST, has initiated a research management system. The intention is to collect and safely store data on research activities and outcomes so that there is continuous monitoring of activities in the research community, the sharing of equipment, funding allocations, research outputs, and various other information that is needed. This system is in the final stages of development.

The third lesson is the benefit of an automated system. If there is an effective system in place, the SGC can operate more effectively. After setting up a more advanced system in Zambia, there was more efficiency in the disbursement of funds. In addition, the NSTC had an increased inflow of grants from various partners and donors. For example, the Council got funding from IDRC for trilateral and bilateral calls. Universities also improved their systems and replaced the use of a centralised account for fund disbursement with special accounts opened for specific projects to facilitate simpler project implementation.

11 Summary of findings

1. One of the key issues that this study focused on was understanding governance structures so that ways of accessing and leveraging funds could be explored. The data available indicates that the establishment of SGCs tasked with the responsibility of disbursing funds seems to have led to governments allocating more money for research. For all three countries with independent SGCs, their R&D allocations have increased; although allocations are still below the 1% of GCP target, progress is being made towards achieving this goal. For Botswana, where there is no independent SGC, we were



unable to assess the progress towards the 1% goal. The last known funding level was 0.5% in 2013. For more details refer to Table 3.

2. The challenges Africa face are daunting, and no single stakeholder can tackle them alone. A strategy that seems to work to increase research funding is to enter into partnership arrangements with the private sector and development agencies to fund research – particularly research that addresses top national priorities. The NRF in South Africa has made significant strides in this area, laid out in the NRF Industry Partnership Strategy. In it, the NRF spells out its approach to being responsive to industry needs, mobilising resources and promoting joint programming. This strategy can serve as a model for other SGCs. Kenya has already started engaging the private sector and funds research that is carried out in the private sector. For both Botswana and Zambia, progress is being made towards involving the private sector in contributing funds for research; currently their involvement is limited to joint programming and activities.
3. In terms of SGC governance structures and interactions between role players, there are various well-coordinated models in place. For example, PASRES in Côte d'Ivoire and NSTIC in Kenya each consist of three main entities that communicate regularly. In the case of PASRES, there is a common officer sitting in all three entities, while the CEOs of all three entities in the NSTIC participate in each other's meetings to promote collaboration. For Zambia, coordination is achieved by having the CEO serve the dual role of Secretary of the Council and Secretary of the Technical Committee of the Board while they are still in transition. There were indications that coordination included collaboration in setting up research priorities and aligning them with national and regional development goals. In Botswana, coordination is achieved through the Joint Botswana Committee – particularly so as to ensure that development agendas are addressed in a more efficient way. To advance the development agenda on the continent, the African Union established the STISA in 2014 to serve as a guide for mainstreaming science and technology into development plans, supported through research in individual countries.
4. There was evidence of resource sharing through joint projects across national borders to address

common national and continental agendas.

One such example was the joint work between Botswana and Zimbabwe, funded by a third party – the NRF in South Africa. Another partnership was between PASRES and the government of Switzerland, that signed a scientific cooperative agreement in 2006. PASRES thus has a Swiss representative on their Council.

5. One of the challenges mentioned frequently was that there was no direct link between research and development and that policy-makers are more interested in tangible outcomes of research to justify continued funding. A strategy that has been adopted in Kenya and Zambia is to establish a unit for the valorisation of research. There are increased efforts to showcase research products with the hope of encouraging funding for upscaling and for others to benefit from the work produced.
6. Lessons learned from the COVID-19 pandemic include that work can be accomplished with a lean structure supported by technology if governments invest in sound infrastructure, such as updated office equipment and computers. For example, providing staff with laptops to be used both in and out of the office is something SGCs could consider as they move forward. Improved connectivity has also proved to be an asset in efficient disbursement of research funds and quicker delivery on research.

12 Conclusions and recommendations

The recommendations are based on two data sources: issues that emerged in the literature review and the study findings from interactions with the SGCI community.

First, our findings from both data sources show that SGCI in Africa has proven to be an important and viable initiative, as SGCs play a pivotal role in attracting more funding for R&D in Africa. It is thus important that this initiative be strengthened and efforts consolidated so that R&D in Africa can attract the necessary funding.

Second, our findings from the literature show that valorisation of research product is still lacking in Africa



due to a combination of factors related to researchers and policy-makers; these factors have been explicitly discussed in this report. We suggest that in order for valorisation of research to be effectively achieved, policy briefs should be made a part of the expected outcomes of funded research. This would address the issue of linking research to policy in Africa.

Third, the frames of action proposed by St John (2013) offer different modes of linking researchers with policy-makers and how they interact with each other in the process of carrying out research for policy impact. We recommend utilising the two modes which encourage and facilitate a healthy interaction between policy-makers and researchers. The first is the instrumental frame, which allows policy-makers to commission evaluative studies that would assess the effectiveness of their policies. Second is the open strategic frame, where researchers focus on the production of information and new ideas that policy-makers could use to address current policy challenges. To implement these ideas, special grants could be made available to address the production of timely knowledge to inform policies in the pipeline or practices in a specific context. In addition, general grants can still be provided for other research projects with more long-term benefits.

Fourth, funding for research in all African states remain below 1% of GDP. However, some progress has been made by various governments in increasing their funding levels. This is an area where the good work needs to be continued in advocating for additional resources and striving for at least a 1% funding allocation to R&D.

Fifth, there are innovations and models which are unique to individual SGCs in terms of improving their governance structures, valorising research and mobilising all concerned stakeholders within and beyond national borders. In the three case study countries with independent SGCs, there seems to be more coordination in setting research priorities and aligning them with national government agendas. These individual models could be explored by other SGCs for the purpose of improving and consolidating their governance structures and boosting their funding capacity for the benefit of the research communities in various countries. These efforts will ultimately achieve the goal of improving the lives of the end users of the research products.

It is important for the research community to take seriously research for knowledge production, as well as to

ensure that their research products can inform policy for the betterment of the general well-being of the citizenry where possible. This plays a very important role in attracting more funding from both the private sector and government for research across Africa.

This study further corroborates existing literature vis-à-vis funding of research in Africa. A major problem identified is that most politicians expect research products to be tangible and usable for them to justify the funding of research. Currently, there is a lack of sufficient research outputs of this kind on the one hand, and a lack of awareness of what is being achieved and produced by research on the other hand. Both of these issues need to be addressed by SGCs.

In addition, it is important for SGCs in Africa to cooperate and stay abreast of one another's operations in order to learn from one another and establish best practices. This approach would enable SGCs to grow and improve within the shortest possible period. For instance, NRF Kenya has indicated the need for some assistance in soft skills needed for resource mobilisation from the private sector. An innovative strategy followed by the NRF Kenya was to create a documentary on current research projects that have been in progress for several years and are in their final stages. This documentary showcased the achievements and successes of these projects to a broad public audience – an example of an approach that could be explored by other SGCs.

African countries need research that not only produces useful products but that can effectively inform policy in order for research to have the maximum social impact and contribute to development on the continent. Innovative strategies are needed to achieve this – one of which is partnering with African academics in the diaspora for research collaborations that can yield the products needed for Africa's transformation and development. Furthermore, researchers should be encouraged to make their research more accessible by producing policy briefs. This is not a skill that many researchers have, hence workshops on writing policy briefs would be helpful. If policy-makers see the direct benefit, they are more likely to make additional funds available.

An area for further research that emerged prominently from this study is exploring how to effectively use research for greater social impact and not only for academic advancement.



References

- African Union Development Agency-NEPAD (AUDA-NEPAD). (2017). *About us*. <https://www.nepad.org/who-we-are/about-us>
- Ajolor, O. V. (2018). The challenges of policy implementation in Africa and sustainable development goals. *PEOPLE: International Journal of Social Sciences*, 3(3), 1497–1518.
- Broadbent, E. (2012). *Politics of research-based evidence in African policy debates. Synthesis of case study findings*. Evidence Based Policy in Development Network (EBPDN). <https://www.alnap.org/system/files/content/resource/files/main/126565-ebpdn-synthesis-1.pdf>
- Bailey, T. (2010). The research–policy nexus: Mapping the terrain of the literature. Paper prepared for the Higher Education Research and Advocacy Network in Africa (HERANA). Centre for Higher Education Transformation (CHET).
- Chataway, J., Dobson, C., Daniels, C., Byrne, R., Hanlin, R., & Tigabu, A. (2019). Science granting councils in Africa: Trends and tensions. *Science and Public Policy*, 46(4), 620–631.
- Gaillard, J., & Van Lill, M. (2014). Science granting councils in sub-Saharan Africa. Country report: Côte d'Ivoire. Centre for Research and Evaluation, Science and Technology (CREST), Stellenbosch University.
- Gluckman, P. (2013). The role of evidence in policy formation and implementation: A report from the Prime Minister's Chief Science Advisor. New Zealand: Office of Prime Minister's Science Advisory Committee.
- Haas, B., & Kwaak, V. (2017). Exploring linkages between research, policy and practice in the Netherlands: Perspectives on sexual and reproductive health and rights knowledge flows. *Research Policy and Systems*, 15(40), 1–13.
- Hanlin, R., Numi, A., Daniels, C., Byrne, R., & Pointel, S. (2020). Updating the case studies of the political economy of science granting councils in sub-Saharan Africa. Technical Report. International Development Research Centre (IDRC), Canada.
- Harris, R. (2015). The impact of research on development policy and practice: This much we know. In A. Chib, J. May, & R. Barrantes (Eds.), *Impact of information society research in the Global South* (pp. 21–43). Springer.
- Jaumont, F. (2016). *Unequal partners*. Palgrave Macmillan.
- Juma, C., & Clark, N. (1995). Policy research in sub-Saharan Africa: An exploration. *Administration and Development*, 15, 121–137.
- Khaemba, W. (2018a). 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 Botswana. African Centre for Technology Studies (ACTS). <https://www.acts-net.org/images/SGCI/Baseline-Reports/Baseline-Report-Botswana.pdf>
- Khaemba, W. (2018b). 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 Kenya. African Centre for Technology Studies (ACTS). <https://www.acts-net.org/images/SGCI/Baseline-Reports/Baseline-Report-Kenya.pdf>
- Koenig, M. (2005). The links between academic research and public policy in the field of migration and ethnic relations: Selected national case studies. *International Journal of Multicultural Societies*, 7(1), 1–2.
- Konig, T. (2017). *The European Research Council*. Polity Press.
- Lindgren, J. H., & Kehoe W. J. (1981). Focus groups: Approaches, procedures and implications. *Learning Disabilities: Research and Practice*, 11, 96–106.
- Lugo-Gil, J., Jean-Baptiste, D., & Jaramilo, L. F. (2019). Use of evidence to drive decision-making in government. US Department of Health and Human Services.
- Mouton, J. (2006). Science for transformation: Research agendas and priorities in South Africa. In L. Box & R. Engelhard (Eds.), *Science and technology policy for development: Dialogues at the interface* (Ch. 5). Anthem.
- Mouton, J. (2008). The state of social science in sub-Saharan Africa. In *World Social Science Report* (pp. 63–67). UNESCO Publishing.
- Mouton, J., Gaillard, J., & Lill, M. (2014). Science granting councils in sub-Saharan Africa. Technical report submitted to International Development Research Centre (IDRC-CRDI).
- Mouton, J., Gaillard, J., & Lill, M. (2015). Functions of science granting councils in sub-Saharan Africa. In N. Cloete, P. Maasen, & T. Bailey (Eds.), *Knowledge production and contradictory functions in African higher education* (pp. 148–170). African Minds.
- National Research Council. (2008). *Rebuilding the research capacity at HUD*. The National Academic Press.
- National Research Foundation (NRF). (2019). The NRF–Industry Partnership Strategy. <https://www.nrf.ac.za/wp-content/uploads/2021/05/The-NRF-Industry-Partnership-Strategy.pdf>
- Naude, C. E., Zani, B., Ongolo-Zogo, P., Wiysonge, C. S., Dudley, L., Kredo, T., Garner, P., & Young, T. (2015). Research evidence and policy: Qualitative study in

- selected provinces in South Africa and Cameroon. *Implementation Science*, 10(126), 1–10.
- Ndunda, M., & Maina, F. (2021, December 16). Creating an environment for intellectual capital remittance. *University World News. Africa Edition*. <https://www.universityworldnews.com/post.php?story=20211101095524471>
- Nutley, S., Davies, H., & Walter, I. (2002). Evidence-based policy and practice: Cross sector lessons from the UK. Working Paper No. 9. ESRC UK Centre for Evidence-Based Policy and Practice.
- Olomola, A. S. (2007). An analysis of the research–policy nexus in Nigeria. In E. T. Ayuk & M. A. Maouani (Eds.), *The policy paradox in Africa: Strengthening links between economic research and policymaking* (pp. 165–184). Africa World Press & International Development Research Centre.
- Osagie, R. O. (2012). Federal government funding of research in universities in Nigeria: The University of Benin as a case study. *International Education Studies*, 5(6), 73–79.
- Ozor, N., Bolo, M., Oriama, R., & Musila, F. (2020). Networking Africa's science granting councils: Building partnerships and networks among science granting councils and other science system actors in sub-Saharan Africa. Final technical report from SGCI Theme 4. IDRC. <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/58621/58758.pdf>
- Parkhurst, J. (2017). *The politics of evidence: From evidence-based policy to the good governance of evidence*. Abingdon: Routledge.
- Science Granting Councils Initiative (SGCI). (2017). Towards effective public-private partnerships in research and innovation: Research grant concept note and terms of reference. SGCI in sub-Saharan Africa.
- Science Granting Councils Initiative (SGCI). (2018). Commissioned studies: Public – private partnerships in research and innovation. Concept note and terms of reference. SGCI in sub-Saharan Africa.
- Science Granting Councils Initiative (SGCI). (2018a). New approaches for funding research and innovation in Africa, Concept note and terms of reference for authors. SGCI in Sub-Saharan Africa.
- Science Granting Councils Initiative (SGCI). (2021). Theme: Public engagement in research and innovation for development. Concept note and terms of reference. SGCI in Sub-Saharan Africa.
- Sheikheldin, G. (2018). Science Granting Councils Initiative (SGCI) 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 Zambia. Science, Technology and Innovation Policy Research Organization (STIPRO). <https://www.acts-net.org/images/SGCI/Baseline-Reports/Baseline-Report-Zambia.pdf>
- Soare, L. (2013). Creating a linkage between academic research and policy-making. *Europolity*, 7(2), 89–102.
- Space in Africa. (2020, July 27). South Africa cuts science and innovation budget: Announces plan for the future. <https://africanews.space/south-africa-cuts-science-and-innovation-budget-announces-plan-for-the-future/>
- St John, E. P. (2013). Tools of state: Using research to inform policy decisions in higher education. *International and Multidisciplinary Journal of Social Sciences*, 2(2), 118–144.
- Teseletso, T. (2021, September 20). BIUST's physics & astronomy department hosts DARA training. *BIUST News*. <https://www.biust.ac.bw/blog/biusts-physics-astronomy-department-hosts-dara-training/>
- Tigabu, A. D., & Khaemba, W. (2020). Science granting councils in Africa: Catalysts of innovation for sustainable development? In R. Hanlin, A. D. Tigabu, & G. Sheikheldin (Eds.), *Building science systems in Africa* (pp. 1–26). ACTS Press.
- Tijssen, R., & Kraemer-Mbula, E. (2018). Research excellence in Africa: Policies, perceptions, and performance. *Science and Public Policy*, 45(3), 392–403.
- University World News. (2021, December 16). Creating vibrant and stronger research communities. <https://www.universityworldnews.com/post.php?story=20211215131016702>
- Uzochukwu, B., Onwujekwe, O., Mbachu, C., Okwuosa, C., Etiaba, E., Nyström, M. E., & Gilson, L. (2016). The challenge of bridging the gap between researchers and policy makers: Experiences of health policy research group in engaging policy makers to support evidence informed policy making in Nigeria. *Globalization and Health*, 12(67), 1–15.
- Waruru, M. (2021, December 10). Researchers failing 'relevance test', some HE ministers say. *University World News*. <https://www.universityworldnews.com/post.php?story=20211210065625160>

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