



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

AN OVERVIEW OF BASELINE ASSESSMENTS OF PUBLIC-PRIVATE PARTNERSHIPS
IN RESEARCH AND SCIENTIFIC COOPERATION IN 15 SUB-SAHARAN AFRICAN
SCIENCE GRANTING COUNCILS

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1. Introduction

Collaborative research among higher education, research and the private sector organizations has a potential to result in economic growth and improved living standards¹. Besides, historically, research collaboration has been viewed as a key mechanism of scientific research capacity building in developing countries². While international research collaboration in Africa has increased in recent years³, research collaboration and collaborative knowledge production within national borders and among researchers in Sub-Saharan African countries remain limited⁴. Facilitating research linkages among public-private research actors has, therefore, been a crucial undertaking for many African Governments. One way of doing this is by establishing Science Granting Councils (SGCs) with core mandates of funding scientific research but also promoting, advocating, regulating and coordinating Science Technology and Innovation activities in national settings.

Despite this, a recent survey on capacity building needs of SGCs in Sub-Saharan Africa⁵, in general, found out that SGCs face several institutional challenges, such as inadequate internal institutional mechanisms to manage grant processes, as well as monitoring and evaluation of funded projects. A recent study on the political economy of SGCs in Africa also suggests that similar challenges are pervasive, influencing the performance of SGCs. Theme 3 of the Science Granting Councils Initiative (SGCI)⁶ aims to address some of these challenges, which 15 SGCs are grappling with, with a focus on strengthening SGCs' capabilities of facilitating and managing scientific public-private partnerships (PPPs) and cooperation between SGCs.

As part of the project implementation of Theme 3 of the SGCI, ACTS consortium members conducted 15 baselines studies with the aim of assessing the status of PPPs facilitated by SGCs and inter-SGC formal collaborations. The exercise also identified the factors that promote or constrain public-private partnerships (PPPs), scientific collaboration and knowledge transfer between or among SGCs. The final aim of the analysis was to evaluate SGCs' capacity needs and skill gaps for collaboration with other organizations.

This report provides an overview of baseline characteristics of PPP and international collaboration initiatives of the 15 SGCs⁷ (see Table 1 for the list of countries and corresponding SGCs where the baselines are conducted).

¹ Edmondson, G., Valigra, L., Kenward, M., Hudson, R.L. and Belfield, H. (2012). Making industry-university partnerships work: lessons from successful collaborations. Science | Business Innovation Board AISBL. <http://www.sciencebusiness.net/sites/default/files/archive/Assets/94fe6d15-5432-4cf9-a656-633248e63541.pdf>

² Wagner, C.S., Brahmakulam, I.T., Jackson, B.A., Wong, A. & Yoda, T. (2001). Science and technology collaboration: Building capacity in developing countries? Santa Monica: Rand.

³ Pouris, A., & Ho, Y. S. (2014). Research emphasis and collaboration in Africa. *Scientometrics*, 98, 2169–2184. doi:10.1007/s11192-013-1156-8

⁴ Onyancha, O. B., & Maluleka, J. R. (2011). Knowledge production through collaborative research in Sub-Saharan Africa: How much do countries contribute to each other's knowledge output and citation impact? *Scientometrics*, 87(2), 315–336.

⁵ Mouton, J. and Coates, D. (2016). Capacity building needs assessment survey. Science Granting Council Initiative (SGCI). Centre for Research on Evaluation, Science & Technology, Stellenbosch University

⁶ <https://sgciafrica.org/en-za/about-sgci/Pages/Partnerships-and-private-sector-engagement.aspx>

⁷ In the context of this report, PPP refers to a publicly-funded research collaboration among research and higher education organizations, such as universities, science funding agencies, such as SGCs and industry or private sector actors within a particular national context. International collaboration of an SGC refers to a formal research partnerships that an SGC under study have established or started negotiations with other SGCs or international actors.

Table 1: Baseline study countries and corresponding SGCs.

Countries	SGCs
Burkina Faso	Fond National de la Recherche et de l'Innovation pour le Développement (FONRID)
Botswana	Department of Research Science and Technology (DRST), Ministry of Tertiary Education, Research Science and Technology (MoTE) *
Mozambique	Fundo Nacional de Investigação (FNI)
Ethiopia	National Science and Technology Research Council (NSTRC)
Ghana	Directorate of Science and Technology (DST) in the Ministry of Environment, Science, Technology and Innovation (MESTI)
Ivory Coast	Programme d'Appui Stratégique à la Recherche Scientifique (PASRES)
Kenya	-National Commission for Science and Technology and Innovation (NACOSTI), -National Research Fund (NRF), -Kenya National Innovation Agency (KENIA)
Malawi	National Commission for Science and Technology (NCST)
Namibia	National Commission on Research Science and Technology (NCRST)
Rwanda	National Commission for Science and Technology (NCST)
Tanzania	Commission for Science and Technology (COSTECH)
Uganda	Uganda National Council for Science and Technology (UNCST)
Zimbabwe	Research Council of Zimbabwe (RCZ)
Senegal	-Direction Générale de la Recherche et d'Innovation (DGRI), Ministry of Higher Education and Research [national SGC], -Institut Sénégalais de Recherches Agricoles (ISRA) [parastatal SGC dedicated to agricultural research] **
Zambia	National Science and Technology Council (NSTC)

* Note: Botswana does not have a formal SGC. However, DRST coordinates Research Science and Technology in Botswana.

**The Senegalese baseline report indicates a third science funding agency named Institut de Recherche pour le Développement (IRD). The baseline also reports that IRD is an international SGC first established in France in 1947 (headquarters in Paris then Marseilles) and later on it created a branch in Senegal in 1949. The baseline report indicates that IRD has strong partnerships with Senegalese universities in a range of disciplines, such as agriculture, social sciences, public health, geology, oceanography.

The report is structured as follows. The subsequent section highlights the methodology employed to develop individual baseline studies. Section 3 provides an overview of the key findings, highlighting the status of PPP and inter-SGC collaborations, including enabling and constraining factors. Finally, Section 4 briefly concludes the report and provides some recommendations.

2 Methodology

This baseline overview summarises the finding of 15 baseline studies. Of the 15 baseline studies, 10 were largely developed from interviews of key informants (carried out in late 2017) from SGCs, academia, public institutions and the private sector in 10 African countries, complemented with a desk research also undertaken in late 2017. The remaining five baseline reports were 'light-touch' studies that were developed, largely based on reviews of reports, websites, and published and unpublished literature⁸. See Table A1 in the Appendix for the list of baseline study countries, researchers and corresponding institutional affiliations.

⁸ One baseline report (Zambia) was originally planned to involve interviews. However, due to logistical issues, interviews were not conducted and the baseline was written only based on secondary information collected online and data provided by NSTC of Zambia.

3. Overviews of key findings

3.1 State of PPP collaborations facilitated by SGCs

Many of the 15 baseline studies have reported qualitative descriptions of local research collaborations, largely initiated or facilitated by SGCs. This is highlighted in Table 2. Table 2 shows that most of the studied countries (11 countries) have not independently initiated or facilitated a large number of research PPPs as of end 2017.

Table 2: Status of PPP collaborations facilitated by SGCs

Country	Overviews on the status of SGC-facilitated PPP based on baseline reports
Mozambique	There is a reasonably good level of collaboration between researchers and the private sector in Mozambique, and it is continuously improving since 2010.
Botswana	Botswana does not have a formal SGC. However, Botswana has collaboration with the private sector in infrastructure development but this practice does not seem to have extended to research with only a few collaborations in existence
Burkina Faso	FONRID does not have formal MOUs with the private sector, universities, and researchers in Burkina Faso. However, it has established collaborative relationships with organizations receiving grants from it. It has also been funding (joint) research projects in Burkina Faso.
Ethiopia	Facilitating knowledge transfer to the private sector and facilitating university-industry collaboration are mainly the roles of other departments at the Ministry of Science and Technology (MoST). NSTRC is also funding a number of (joint) research projects every year since 2015, but the participation of the private sector is limited.
Ghana	DST is working to establish a Science, Technology and Innovation (STI) Fund by mid-2018. There has been some level of experience in facilitating PPPs in research and innovation through the establishment of five Technology Development and Transfer Centres (TDTC) in various universities and R&D institutions, yet the involvement of the private sector is limited.
Ivory Coast	PASRES reported that the current level of collaboration among PASRES, private sector actors and academia is 'poor', but PASRES is implementing new structures that are likely to ensure improved research collaboration.
Kenya	NACOSTI and NRF have funded a large number of research projects with private sector involvement.
Malawi	NCST has a good record of collaboration with academia. But in comparison, it has a poor collaborative relationship with the private sector in Malawi.
Namibia	NCRST has partnerships with a number of private sector players including SME Bank limited with the goal of supporting Namibia's SMEs (small and medium-size enterprises). This is achieved through entrepreneurship development programmes, business linkages, and funding innovation projects that demonstrate a potential for growth.
Rwanda	NCST (of Rwanda) has been restructured recently. However, generally in Rwanda, the launch of Knowledge Transfer Partnership (KTP) in January 2013 under the umbrella of African Knowledge Transfer Partnerships (AKTPs) is viewed to be useful in promoting the level of PPPs in Rwanda.
Tanzania	COSTECH has a working relationship with a number of private sector actors and public organizations. This includes, for example, partnerships with Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA), Confederation of Tanzania Industries (CTI), Vocational Education and Training Authority (VETA),

	and Tanzania Private Sector Foundation (TPSF). In general, however, collaborative research between researchers and private sector, facilitated by COSTECH, is currently not common.
Uganda	UNCST has pursued research collaborations with a number of local actors, including with private sector in projects in themes ranging from agro-processing to medical diagnostics and drug development and testing, manufacturing, software development and STEM education.
Zimbabwe	There is limited research collaboration between the private sector and research and academic organizations. Despite this, there are collaborative projects in Zimbabwe, for example on cultural heritage, harnessing wind energy, and feedstock production for broiler production. RCZ has signed an MOU with other institutions, such as Midlands State University (MSU) and Bindura University of Science Education (BUSE).
Senegal	DGRI collaborates with local partners in project funding, staff exchange programmes, and sharing of research infrastructure (e.g. research labs). Despite this, DGRI's collaboration with the private sector is quite limited. On the other hand, ISRA has strong bilateral collaborations with universities in Senegal, as well as local agricultural associations. ISRA collaborates with the private sector, mainly in agribusiness.
Zambia	NSTC has been funding or co-funding a large number of research conducted by universities or national research institutes in Zambia. Some examples of NSTC partners in Zambia include: The University of Zambia (UNZA), National Remote Sensing Centre (NRSC), The National Technology Business Centre (NTBC), The Copperbelt University (CBU), Zambia Information and Communications Technology Authority (ZICTA), The Zambia Agriculture Research Institute (ZARI), National Institute for Scientific and Industrial Research (NISIR). However, based on data acquired from NSTC and desk research, the involvement of the private sector in collaborative research is limited.

3.1.1. Enabling factors of research collaboration and knowledge transfer between SGCs and other local actors

According to the baseline studies, a key driver of scientific PPPs in the studied countries is the benefit of research partnership itself. Asked about the major benefits that SGCs may gain from scientific PPPs, interviewees responded that capacity development, access to experts for proposal reviews, access to infrastructure, such as ICT services, research equipment and laboratories, knowledge for better processes and procedures of grants management and a need for collective knowledge to solve complex problems are some of the major advantages. It is also reported that collaborations enhance productivity, and help achieve SGCs' organizational objectives and mandates. Interviewees from academia also concurred with most of these perceived benefits of research collaboration between different stakeholders. However, they added that joint publications, better opportunities for joint projects and scientific recognition are key for academics to collaborate with other researchers. Some of the suggested benefits of collaboration seemed to differ, depending on the type of collaborative engagement that an organization has with other stakeholders.

The baseline studies also reflected on SGC-internal policies, capacities and capabilities and SGC-external policy and legal frameworks that may enable local research collaboration and knowledge transfer between SGCs and other stakeholders. The results reveal that (See Table 3) most SGCs do not have specific SGC-internal policies and regulations that govern technology transfer and research partnerships at local levels. When it comes to SGC-external policy and legal frameworks, most SGCs reported at least one national (science and technology) policy that enables local research collaborations. In the case of SGC capacities and capabilities, most SGCs do not have a sufficient

number of staff with the required skills on private sector engagement, technology transfer, partnerships management, team building, and research management.

Table 3: Factors enabling local research collaboration and knowledge transfer between SGCs and research institutions and the private sector

Country	SGC-internal policies and regulations	SGC capacities and capabilities	SGC-external policy and legal frameworks
Mozambique	General rules and regulations for funding activities of FNI govern funding, technology transfer and partnerships.	16 permanent, 14 contracted and 5 intern staff. Skillsets to manage private sector engagements need to be developed further.	-Government's vision of putting Science and Technology as an engine of poverty reduction, - National Research Agenda of Mozambique,
Botswana	Botswana does not have an SGC	Botswana does not have an SGC	National Policy on Research, Science, Technology and Innovation
Burkina Faso	FONRID does not have any specific internal policy framework, which governs its knowledge transfer and collaboration efforts. However, it is reported that FONRID's strategic plan plays a key role.	31 staff involved in research and programme development and implementation, finance, human resource, cooperation, communication and IT, and resource mobilization	NA
Ethiopia	NSTRC has internal financial and grants management regulations. There are no other internal policy frameworks that govern NSTRC's PPP engagements.	NSTRC has seven staff. Yet, none is viewed to possess significant expertise in private sector engagement, technology transfer, partnerships management and team building.	-Science, Technology and Innovation (STI) policy - Industrial Development Strategy.
Ghana	NA	MESTI has six staff managing collaborations with the SGCs and two staff managing collaborations between researchers and the private sector.	-National Science, Technology and Innovation Policy, - ICT Education policy
Ivory Coast	NA	PASRES has nine staff. The team is made up of graduates in law, economics and management.	NA
Kenya	NA	NACOSTI has relatively well-established organizational structure, with a sizable staff. NRF and KENIA, in contrast, are still taking shape with	Science, Technology and Innovation Act of 2013

		each having less than 10 staff and largely reliant on NACOSTI's infrastructure. It is expected that KENIA will set up and employ staff in Kenya's 47 counties raising its human capacity.	
Malawi	There are no internal particular policy frameworks within which NCST operates in the area of partnerships management.	NCST has one expert in Technology Transfer.	<ul style="list-style-type: none"> - Act of Science and Technology, 2003 - Intellectual Property Rights (IPR) (to be approved) is seen by actors in public, academia and private sectors as an enabler for public-private partnerships in future.
Namibia	NA	NA	National Policy on Research, Science and Technology (NPRST)
Rwanda	NCST is developing a number of short-term and long-term strategic plans and frameworks, such as National Research and Innovation Fund Strategy, including an analysis of the research funding system in Rwanda.	NA	<ul style="list-style-type: none"> -Science Technology and Innovation Policy (STIP, 2005) -National Industrial Policy (NIP, 2011)
Tanzania	Based on available data, there are no particular policy frameworks within which COSTECH operates regarding PPPs, for example, industry-research linkages.	COSTECH has two staff on managing collaborations between researchers and the private sector, three staff with skills on private sector engagement, five staff with skills on technology transfer and another five staff with skills on partnership management.	<ul style="list-style-type: none"> -Second National Science and Technology Policy (1996) - It is expected that COSTECH will prepare a national research agenda.
Uganda	UNCST Act (1990)	UNCST is currently staffed with technical and administrative staff that helps it deliver on its mandate. However, staff are few and lack of skillsets to manage research partnerships.	<ul style="list-style-type: none"> - National Science and Technology Policy (NSTP) - National Science, Technology and Innovation Plan (NSTP) 2012/2013 - 2017/2018, - Uganda's Vision 2040
Zimbabwe	NA	NA	-Second Science and Technology Policy (2012)

			- Public-Private Partnership in Zimbabwe Policy and Guidelines of 2004
Senegal	NA	NA	NA
Zambia	NA	NA	Zambia's Act of Parliament that established the National Science and Technology Council (NSTC)

Note: NA refers to 'Not Available', i.e. data are not available or accessible to the author(s) on the basis of the individual baseline study reports.

3.1.2. Constraining factors of research collaboration and knowledge transfer between SGCs and other local actors

Asked about the factors that (negatively) influence collaboration between SGCs, research organizations and the private sector, interviewees from SGCs reported that lack of sufficient funding, limited technical competence of staff, limited interest in research funding and engagement by the private sector, challenges in designing legal instruments that govern collaborations, such as consortium agreements, contracts, MoUs, are major obstacles. Lack of decision-making autonomy of SGCs also appears to constrain PPP research collaboration in some of the study countries. A typical example is the case of Botswana where a ministerial department, Department of Research Science and Technology (DRST), is currently coordinating STI and research activities in the country as Botswana awaits the formation of a formal SGC. It is believed that the establishment of a formal SGC will foster greater collaboration with the private sector and other SGCs. Conflicting roles and overlapping mandates of different departments of SGCs or Government ministries have also been reported to affect the performance of SGCs, and by extension their PPP and inter-SGC collaboration. This was especially reported in the case of Kenya in which there are three separate entities involved in coordinating STI with somehow related mandates. In Senegal, it is reported that lack of a Science, Technology and Innovation Policy negatively influences PPPs.

Interviewees from academia and research organisations reported that lack of appropriate research infrastructure that is aligned to the needs of the private sector; lack of appropriate reward and incentive mechanisms for researchers to collaborate with the private sector; knowledge gap between researchers, private sector actors, and policymakers, i.e. lack of competence, interest and awareness about the importance of collaborative research among private sector actors and decision makers; poor understanding of the role of STI by decision-makers; lack of resources (insufficient financial and human resources and logistics, such as loans, venture capital and tax incentives); lack of technical support for needs assessment and technology appraisal; and conflict of interest are among the major barriers. It is also reported that weak coordination, lack of linkage platforms, and limited ownership of research projects and buy-in by researchers as well as interpersonal relationships, such as mutual respect and trust are factors that determine research collaboration in the studied countries.

On the other hand, private sector respondents reported that lack of 'quick' incentives in doing research, limited number of private-sector oriented research initiatives, lack of supportive policy frameworks (e.g. sufficient regulations on intellectual property rights), under-developed research culture and limited awareness about the value of research, lack of sufficient platforms that link public research organizations with the private sector are the major obstacles. Skill mismatch of graduates with industrial sector requirements was also reported in some countries, such as Ivory Coast and Tanzania. The baseline study from Zimbabwe also indicated that lack of proper guidelines on data protection and sharing as well challenges in commercializing research outputs often discourage research PPPs.

Other broader factors, such as economies being highly reliant on natural-resource extraction, size of the private sector relative to other economic actors, have also been reported to influence collaboration and knowledge transfer with the private sector.

3.2 State of SGCs' collaboration with other SGCs

The baseline studies highlighted bi-lateral, tri-lateral and regional research collaboration agreements, which SGCs have formally entered with other SGCs and other international partners. These results indicate that at least nine countries have entered formal collaboration agreements with at least one SGC (See Table 4). The results show that as of end of 2017 most of the studied countries (nine countries) have few inter-SGC collaborations.

Table 4: Status of SGCs' collaboration with other SGCs

Country	Status of inter-SGC collaboration
Mozambique	FNI has entered into several formal collaboration agreements with other SGCs and international partners while a number of other prospective collaborations are under negotiation at the time of field visit of this study
Botswana	Online evidence shows that Botswana has entered a collaborative agreement with few African countries with collaboration themes ranging from indigenous knowledge to ICTs and space science
Burkina Faso	NA
Ethiopia	NSTRC's collaboration with international, regional and international research agencies has largely been limited to sharing experiences. NSTRC does not have formal collaborative research agreements independently. MoST is leading and managing international partnerships on research and STL.
Ghana	MESTT's regional and international research collaborations are limited. A notable example is a bilateral collaboration is with the Department of Science and Technology (DST), South Africa.
Ivory Coast	Official collaboration between PASRES and other SGCs has not been reported. However, unofficial or informal collaborations are underway, especially with SGCs from Ghana, Burkina and Senegal.
Kenya	Available data show that Kenya has signed agreements and MoUs with seven African countries on various areas, including knowledge exchange and joint projects. It has actively collaborated with countries in the East African Community (EAC) with its aspiration of making the EAC a hub for science and technology.
Malawi	NCST has a good working relationship with other SGCs in Africa but no signed MoUs or other collaboration agreements.
Namibia	Available data show that NCRST has signed Agreements and MoUs with at least three African countries (most notably with South Africa) and has ongoing projects with other countries and agencies, such as European Union, African Union Commission and the UN.
Rwanda	There is limited information on the status of scientific collaborations between Rwanda and others SGCs in the region, especially those facilitated by NCST.
Tanzania	COSTECH has some level of transnational partnerships with other SGCs and international originations. These, for example, include a collaboration with the Council of Scientific and Industrial Research (CSIR) of India, with NRF (National Research Foundation) and TIA (Technology Innovation Agency) of South Africa.
Uganda	UNCST is collaborating at least with 11 SGCs in Africa and engaged in at least 13 collaborative projects that involve the private sector.

Zimbabwe	RCZ has signed MOUs with Mozambique and pursuing Namibia and Botswana for a bilateral agreement.
Senegal	NA
Zambia	NSTC has established a working relationship with a number of SGCs in Africa and Europe. These, for example, include: with National Research Foundation (NRF), South Africa; with National Research Fund (FNI); and with German Research Foundation (DFG), Germany—all focussing on joint research funding, conferences and skills and knowledge exchange.

3.2.1 Enabling factors of international collaboration between SGCs

Some of the baseline studies also provided reasons as to why SGCs seek to collaborate with other SGCs. It is reported that international collaborations often bring knowledge and experience sharing opportunities, such as training workshops, seminars, research visits and scientific meetings, which are crucial for capacity development in grant and research management activities. In general, international collaborations are viewed as crucial activities to gain insights into best practices, norms, regulations and procedures of other institutions in different countries. International collaborations are also useful to have access to resources and facilities, such as improved research management systems and software.

Similar to the PPPs described above, the baseline studies also reflected on SGC-internal policies, capacities and capabilities and SGC-external policy and legal frameworks that may enable transnational collaboration and knowledge transfer between SGCs and other international partners. The results generally show that (See Table 5) most baselines did not report data on specific SGC-internal policies and regulations and SGC capacities and capabilities that may enable transnational research partnerships. Similarly, most baseline studies did not report SGC-external policy and legal frameworks that enable their inter-SGC partnership efforts. Only Mozambique, Ethiopia, Namibia, Rwanda, Tanzania, Uganda, and Zimbabwe reported at least one science and technology policy that enables international collaborations with other SGCs or international stakeholders.

Table 5: Factors enabling international research collaboration and knowledge transfer between SGCs

Country	SGC-related policies and regulations	SGC capacities and capabilities	SGC- external policy and legal frameworks
Mozambique	NA	Two staff dedicated to partnerships management. FNI also has a lawyer who oversees legal issues on both local and international engagements.	Science, Technology and Innovation Strategy (MOSTIS)
Botswana	NA	NA	NA
Burkina Faso	NA	NA	NA
Ethiopia	NA	NA	Science and Technology Policy
Ghana	NA	MESTI has six staff managing collaborations with other SGCs	NA
Ivory Coast	NA	NA	NA
Kenya	NA	NA	NA
Malawi	NA	NA	NA
Namibia	NCRST Strategy (2014/5 - 2018/9) and a	NCRST has put together a team to aid delivery of its mandate. Yet, it needs	-Namibia's Vision 2030

	National Programme on Research, Science, Technology and Innovation (NPRSTI 2014/5 - 2016/7) and Implementation Plan	additional staff e.g. on Intellectual Property (IP) among other issues.	-National Policy on Research, Science and Technology (NPRST), - Industrial Property Act of 2012, -Patent Cooperation Treaty of 1995, - WIPO Convention of 1973, -Paris Convention for the Protection of Industrial property, -Convention on Biological Diversity and its protocols, -WTO's Trade-related Aspects of Intellectual Property Rights (TRIPS, 1994), -Africa Regional Intellectual Property Organization (ARIPO)
Rwanda	NA	NA	Science, Technology and Innovation Policy (STIP) (2005)
Tanzania	NA	COSTECH has five staff with skills on partnership management	- Second national science and technology policy (1996) -SADEC framework for the protection of indigenous knowledge
Uganda	NA	NA	Patent Cooperation Treaty of 1995, -WIPO Convention of 1973, -Paris Convention for the Protection of Industrial property, - Convention on Biological Diversity and its protocols, -WTO's Trade-related Aspects of Intellectual Property Rights (TRIPS, 1994) -Africa Regional Intellectual Property Organization (ARIPO)
Zimbabwe	NA	NA	Second Science and Technology Policy (2012)
Senegal	NA	NA	NA
Zambia	NA	NA	NA

3.2.2 Constraining factors of inter-SGC collaboration

According to several of the baseline studies, obstacles that hinder SGCs from entering into transnational collaboration with other SGCs and international stakeholders include: differences in internal grant management policies and procedures of SGCs, language barriers, differences in national Government commitment for STI research funding, lack of political frameworks for bilateral and trilateral or regional research collaborations, differences in the level of economic development between countries, differences in research thematic priorities, lack of common template of Memorandum of Understanding (MoU) between SGCs, level of autonomy of SGCs to make decisions, bureaucracy and differences in fiscal cycles and periods. Other factors include unnecessary rivalry and lack of trust amongst some countries and time constraints. The Zimbabwe baseline study reveals that interviewees from RCZ complained about the lengthy time it takes to negotiate, draft and approve a research cooperation agreement between two or more SGCs.

4. Conclusion and recommendations

SGCI Theme 3 consortium members conducted 15 baseline studies in 15 Sub-Saharan African countries in late 2017 with the aim of assessing the status of PPPs among private and public research actors, mainly facilitated by SGCs. The baselines also attempted to highlight international scientific collaboration between or among SGCs, as well as their enabling and constraining factors. The results show that the perceived benefits of research partnerships, such as capacity development, access to skilled personnel and infrastructure, and knowledge for better processes and procedures, are key drivers of both PPPs and international collaborations in most of the studied countries. The studies also assessed SGC internal factors, such as partnerships management policies, availability of human and financial resources and capabilities, as well as SGC-external national, regional and international policies and frameworks that may enable both PPP and inter-SGC scientific collaborations. The baseline studies, in general, and an assessment based on the baseline reports, in particular, show that most SGCs under this study have not facilitated a large number of PPP partnerships. Similarly, most SGCs have managed to enter with few inter-SGC research collaborations. One of the probable reasons for this is a capacity limitation of SGCs in facilitating and managing research PPPs and international collaborations, as shown by limited SGC-related policies and internal capacities and capabilities.

Based on the preliminary findings from the baseline studies, it is recommended that SGCs may need to strengthen their current performance, both in facilitating PPPs and transnational SGC collaborations. This may also mean that there is a need for targeted support and capacity building measures to develop and ensure the implementation of SGC-internal policy and regulatory frameworks (e.g. private sector engagement strategies, mechanisms of monitoring university-industry linkages), infrastructure (e.g. collaboration platforms, STI information and communication management systems) as well as the quantity and quality of human resource and staffing. Whereas some of these challenges may be met by innovative capacity building measures, such as the SGCI, others will require direct financial and technical assistance. Support through availing additional financial resources and assisting SGCs to find and access alternative funding sources, as well as SGC-targeted training and capacity building initiatives, should be considered.

Another key insight that was pointed out frequently by the baseline studies is the diverse organizational structure of SGCs (i.e. how SGCs are situated within their national political structures in terms of to which ministries they report to and what degree of decision-making independence they have). It is generally observed that some SGCs, for instance in Ethiopia and Ghana, have raised issues related to decision-making independence to initiate, establish and sustain PPPs, and most crucially inter-SGC collaborations. It is, therefore, important that such SGCs increase their decision-making autonomy and organizational 'independence'. SGCs may take the SGCI as an opportunity to actively share experiences with and learn from other SGCs in Africa and beyond. This may then allow them for tabling a strong case for dialogue with relevant authorities in their countries towards their independent establishment.

Appendix

Table A1: Baseline study researchers and their institutional affiliation

Countries	Author	Institution
Burkina Faso	Kwesi Sam & Ruth Dickson	Association of African Universities (AAU)
Botswana	Winnie Khaemba	African Centre for Technology Studies (ACTS)
Mozambique	Aschalew Tigabu	African Centre for Technology Studies (ACTS)
Ethiopia	Aschalew Tigabu	African Centre for Technology Studies (ACTS)

Ghana	Maurice Bolo & Victor Awino	Scinnovent Centre
Ivory Coast	Frank Adjei & Rose Nintin	Association of African Universities (AAU)
Kenya	Winnie Khaemba	African Centre for Technology Studies (ACTS)
Malawi	Gussai Sheikheldin and Heric Thomas	Science, Technology and Innovation Policy Research Organization (STIPRO)
Namibia	Winnie Khaemba	African Centre for Technology Studies (ACTS)
Rwanda	Maurice Bolo & Victor Awino	Scinnovent Centre
Tanzania	Gussai Sheikheldin	Science, Technology and Innovation Policy Research Organization (STIPRO)
Uganda	Winnie Khaemba	African Centre for Technology Studies (ACTS)
Zimbabwe	Maurice Bolo & Victor Awino	Scinnovent Centre
Senegal	Ransford Bekoe & Bunmi Odufala	Association of African Universities (AAU)
Zambia	Gussai Sheikheldin	Science, Technology and Innovation Policy Research Organization (STIPRO)