FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL

FINAL TECHNICAL REPORT FROM SGCI THEME 4: NETWORKING AFRICA'S SCIENCE GRANTING COUNCILS

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Project Title: Networking Africa's Science Granting Councils

Subtitle: Building Partnerships and Networks among Science Granting Councils and Other Science System Actors in Sub-Saharan Africa

FINAL TECHNICAL REPORT

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1. EXECUTIVE SUMMARY:

The Science Granting Councils (SGCs) play a key strategic role in supporting research that contributes to social and economic development. They allocate grants from public funds to research teams, assure quality outputs, enhance coordination of actors in the research systems, and ensure that research findings inform policy and practice. Given this important role and the dynamic nature of scientific developments, there is need to strengthen the capacity of SGCs to perform these roles. This project, under the Science Granting Councils Initiative (SGCI) sought to support the Councils improve their performance by utilizing innovative platforms for building partnerships and networks among the Councils and other science system actors in Sub-Saharan Africa. These platforms, which consist of mainly of the Annual Regional Meeting (ARM) and Annual Forums (AFs) brought together Heads of Councils (HoRCs) and other science system actors in Sub-Saharan Africa (SSA) that met annually and shared evidence, experiences, good practices, and deliberated and developed interventions in strategic Science, Technology and Innovation (STI) areas.

The ARMs and AFs are of strategic importance to the SGCI because they present a unique opportunity to support and strengthen the voices and views of participating Councils; contribute to key STI policy debates at regional and continental levels; contribute to the implementation of the African Union Commission's (AUC) Science, Technology and Innovation Strategy for Africa 2024 (STISA-2024); contribute to new knowledge as a global "public goods"; facilitate sharing of lessons and "good practices" from across the world; provide a platform for sharing information, experiences and lessons amongst participating Councils and with other STI system actors; and showcase its work to country representatives, heads of government missions of funding countries and other interested parties.

The African Technology Policy Studies Network (ATPS) in collaboration with the Scinnovent Centre were mandated to facilitate networking of Africa's Science Granting Councils and other science system actors by organizing the ARMs and AFs over a three-year period. The goal was to foster partnerships and networking to strengthen collaboration and coordination among participating Councils and with other science system actors. This report summarizes the major activities, outputs and impacts over the project period (February 2017 - January 2020). The major activities, outputs and impacts derive from the two ARMs, three AFs and four Monitoring, Evaluation & Learning (MEL) Workshops.

2.   PROJECT BACKGROUND AND JUSTIFICATION:

The Science Granting Councils Initiative in sub-Saharan Africa (SGCI) is a five-year initiative that aims to strengthen the capacities of science granting councils in sub-Saharan Africa to support research and evidence-based policies that will contribute to economic and social development. The Initiative is jointly funded by the United Kingdom's Department for International Development (DFID), Canada's International Development Research Centre (IDRC), South Africa's National Research foundation (NRf) and the Swedish International Development Cooperation Agency (Sida). The SGCI theme four on "Networking Africa's SGCs" is being implemented by the African Technology Policy Studies Network (ATPS) in partnership with The Scinnovent Centre.

Partnerships contribute to joint problem solving, resource exchange, cooperation, coordination and coalition building. They provide the platform to harness the organizational capabilities and human resources in the form of skills, experiences and ideas to tackle common problems that are often beyond the capacity of a single organization.

In acknowledging this important role, the Science Granting Councils Initiative (SGCI) aims to strengthen the capacities of Science Granting Councils (SGCs) in Sub-Saharan Africa (SSA) to establish partnerships amongst themselves and with other science system actors. This is to enhance coordination and networking among Councils in their effort to strengthen national science systems and promote nationally-led research that contributes to development in Sub-Saharan African countries. The Initiative is predicated on a previous study conducted by the Centre for Research on Evaluation, Science and Technology (CREST), Institut de Recherche pour le Développement (IRD), and Stellenbosch University (supported by the IDRC) in 17 SSA countries which revealed among others, a relatively weak networking and coordination among Councils, as well as with other actors in the national and regional science systems. The lack of strong partnerships within the regional blocs and at the continental level is likely to undermine the status, influence and functioning of these Councils in supporting the implementation of STISA 2024 in order to achieve the African Union Agenda 2063.

The Councils and other STI systems actors are central to catalyzing STI through funding, Research and Development (R&D), capacity building, and establishing linkages with private sector among other functions in Africa. However, the capacity of the Councils to perform these key functions and promote linkages within the wider national and regional innovation system is relatively weak. The overall objective of this project was to build partnerships and networks among Science Granting Councils and other science system actors in order to achieve increasingly coordinated and networked Councils in SSA.

3.   GOAL AND KEY OBJECTIVES:

The overall goal of this project was to build partnerships and networks among Science Granting Councils and other science system actors in order to achieve increasingly coordinated and networked Councils in SSA. The specific objectives were to:

  i)   Support and consolidate the voices and views of Science Granting Councils to effectively contribute to key STI policy debates at the regional and continental levels;
  ii)   Provide an intra and inter regional platforms for interaction, information sharing, experiential learning, and collaboration among Councils and other science system actors to contribute to the implementation of the African Union Commission's STISA 2024;

iii) Commission state-of-the-art and publication quality research papers/ reviews on key STI themes in order to share innovative lessons and good practices, and disseminate knowledge as a global public good; and

iv) Promote and disseminate the scientific work, innovations and technologies produced by Councils to key stakeholders such as policymakers, private sector actors, academia, practitioners, and other key stakeholders in the ARM and AFs.

4. PROJECT METHODOLOGY/ APPROACH:

The project team used the ARM and AFs as a one-stop-shop for the presentation, learning, exchange, sharing, and documentation of all the stories of change emanating from the participating Councils. To ensure maximum impact, the project team ensured continued consultations with the participating Councils, SGCI, RECs, and AUC/ NEPAD in the planning processes, agenda setting and actual implementation of the programmes. Already, the ATPS Network has well-established active National Chapters in all the participating SGCI countries namely: Kenya, Rwanda, Uganda, Tanzania, Ethiopia, Côte d'Ivoire, Burkina Faso, Senegal, Ghana, Zambia, Mozambique, Malawi, Namibia, Zimbabwe, Botswana, and Cameroon. ATPS members also belong to the respective Councils' national science systems. These Chapters are in most cases domiciled within the Science Granting Councils themselves or their associate partners such as universities, research institutes and international organizations (Annex 1). The presence of these ATPS National Chapter Coordinators in the participating countries enhanced effective coordination of all in-country planned project activities. This reduced transaction costs, ensured effectiveness and efficiency of operations, and created more avenues for home-grown capacities within the science systems to be built and strengthened.

Methodology and Approach: The project team deployed a mix of innovative methods and approaches to ensure effective and participatory engagements, experiential learning and knowledge sharing by all delegates during the AFs/ARM. Some of these included plenary keynote presentations, roundtable discussions, facilitated breakout sessions, group active engagements, brainstorming sessions, pitching sessions, and paired speaking and listening among others. All sessions were covered by professional rapporteurs and detailed reports provided. The project team paid special attention in the documentation of the stories of change (actions, practices and relationships) that the Councils undergo as a result of the SGCI's interventions. An evaluation form to assess the performance of every forum or meeting was issued to obtain feedbacks from delegates. Such assessment reports were used to plan and manage future events to achieve better performance.

The following activities were implemented to achieve the above stated objectives:

i) Planned and organized in consultation with the Councils, SGCI, RECs and AUC/NEPAD 3 Annual Forums (AFs) and 1 Annual Regional Meetings (ARM) for the Councils and other key stakeholders (objectives 1 and 2);

ii) Commissioned state-of-the-art papers and published quality papers and reviews on selected STI themes in consultation with the SGCI that were shared and discussed at each AF (objective 3);

iii) Organized results, reviews and reflection (R3) workshops as part of each ARM and AF in consultation with the Monitoring, Evaluation and Learning (MEL) Consultant (objectives 1and 2); and

iv) Liaised with the host country Councils to effectively engage government, academia, private sector and other key stakeholders during the ARM and AFs (objective 4).

5.   PROJECT FINDINGS AND OUTPUTS:

I)   FINDINGS

Objective	Finding
Objective 1: Provide an intra and inter-regional platforms for interaction, information sharing, experiential learning, and collaboration among Councils and other science system actors to contribute to the implementation of the African Union Commission's STISA 2024; **Objective 3:** Support and consolidate the voices and views of Science Granting Councils to effectively contribute to key STI policy debates at the regional and continental levels;	**Four (4) Annual Forums namely:** 1. Maputo, Mozambique; "**Research Excellence in sub-Saharan Africa"** 2. Livingstone, Zambia, "**Towards Effective Public-Private Partnerships in Research and Innovation**" 3. Abidjan, Cote d'Ivoire, "**New Approaches for Funding Research and Innovation in Africa**" 4. Dar-es-Salaam, Tanzania, **Open science in research and innovation for development in Africa**" **Two (2) Annual Regional Meetings** 1. Kigali, Rwanda, "**The First Annual Regional Meeting of the Science Granting Councils Initiative in sub-Saharan Africa**" 2. Accra, Ghana "Research, "**Research and Innovation for Job Creation"**
Objective 2: Commission state-of-the-art and publication quality research papers/ reviews on key STI themes in order to share innovative lessons and good practices, and disseminate knowledge as a global public good; and **Objective 4:** Promote and disseminate the scientific work, innovations and technologies produced by Councils to key stakeholders such as policymakers, private sector actors, academia, practitioners, and other key stakeholders in the ARM and AFs.	Eleven (11) publications have been recorded in the following categories namely: • 3 Policy Briefs • 3 Research Papers • 4 Journal articles • 1 Book Chapter

II)   KNOWLEDGE/ LEARNING OUTPUTS

1. Oyelaran-Oyeyinka, B. et al, 2018, Towards Effective Public-Private Partnerships in Research and Innovation: A Perspective for African Science Granting Councils; African Technology Policy Studies Network (ATPS), *Technopolicy Brief No 49.*
2. Oyelaran-Oyeyinka, B. et al, 2018, Towards Effective Public-Private Partnerships in Research and Innovation: A Perspective for African Science Granting Councils; African Technology Policy Studies Network (ATPS), *Research Paper No 29*.

3. Bertha Vallejo & Banji Oyelaran-Oyeyinka & Nicholas Ozor & Maurice Bolo, Public-Private Partnerships in Research and Innovation: Opportunities and Barriers for African Science Granting Councils, I*n Press.*
4. Bertha Vallejo & Banji Oyelaran-Oyeyinka & Nicholas Ozor & Maurice Bolo, 2019. "Open Innovation and Innovation Intermediaries in Sub-Saharan Africa," *Sustainability*, MDPI, Open Access Journal, vol. 11(2), pages 1-18, January.
5. Mugwagwa, J. et al, 2019, New Approaches for Funding Research and Innovation in Africa, African Technology Policy Studies Network (ATPS), *Technopolicy Brief No 50.*
6. Mugwagwa, J. et al, 2019, New Approaches for Funding Research and Innovation in Africa, African Technology Policy Studies Network (ATPS), *Research Paper No 30.*
7. Julius Mugwagwa, Geoffrey Banda, Nicholas Ozor, Maurice Bolo and Ruth Oriama, Optimising governance capabilities for research and innovation in Africa, *In Press*
8. Geoffrey Banda, Julius Mugwagwa, Nicholas Ozor, Maurice Bolo and Ruth Oriama, 2019, Financing African scientific research, translational activities and innovation - the challenges and rays of hope, I*n Press*
9. Boulton, G., Loucoubar, C., Mwelwa, J., Ozor, N., and Bolo, M. (2020) Open science in research and innovation for development in Africa. ATPS Research Paper No. 32.
10. Boulton, G., Loucoubar, C., Mwelwa, J., Ozor, N., and Bolo, M. (2020) The digital revolution, open science and innovation for development in Africa. ATPS Technopolicy Brief No. 52.
11. Ozor, N. et al. (2020) Learning what works: Knowledge exchange and networking among the science system actors in sub-Saharan Africa. In: Hanlin, R, Tigabu A, and Sheikheldin, G, (2020) *Building Science Systems in Africa: Challenges and Opportunities for Science Councils; In Press.*

III) KNOWLEDGE UTILIZATION AND UPTAKE.

Dissemination of each of these outputs has been done through the following means:

1. Emailed to the SGCI Network: Through the comprehensive list of the SGCI stakeholders, most of the key outputs are shared with them e.g. the masterclass paper and other outputs therefrom.
2. Printed and published by the ATPS in English and French in most cases: The Research Papers and Policy Briefs are in most cases printed and published in both English and French languages considering the diversity of the SGCI stakeholders.
3. Printed publications disseminated to the SGCI Network during the communication forums i.e. Annual Forums and Annual Regional Meetings: The Research Papers and Policy Briefs emanating from the masterclass papers are usually distributed during SGCI events such as ARMs, AFs, SGC training events and now the close out workshop.
4. Radio, TV, Newspaper, Blogs: Events, information and outputs from the SGCI have been various communicated and disseminated using various audio-visual and print media. For instance, the ARM in Ghana was published in the Goldstreet Business Newspaper in Ghana on Friday, 6 July 2018. Similarly, the just concluded 2019 AF in Dar was widely disseminated in the national television as well as in over five newspaper publications.

Box 1: Examples of knowledge uptake from the SGCI Masterclasses:

1. In Uganda, a National Research and Innovation Support Framework was established to augment R&D funding towards the recommended regional level (1% of GDP) and consciously finance scientific innovation. The masterclass paper on 'New Approaches to Funding Research and Innovation in Africa' contributed to this outcome.

2. In Uganda, the Uganda National Council for Science and Technology (UNCST) has revised the national research guidelines to include windows of support for social innovations; platforms for academia-industry research collaboration and for greater alignment with regional and global development strategies. The Council is also revising its strategy and approaches to stakeholder engagement in ways that enable co-investment, co-creation and incentivizing multi-stakeholder platforms on various aspects of STI development. The masterclass paper on 'Towards Effective Public-Private Partnership in Research and Innovation' contributed to these outcomes.

3. In Mozambique, the National Research Fund (FNI) has commenced discussions with relevant agencies in the country on how to address the funding limitation for research and innovation development and the need for the establishment of a national research agenda in the country. This is an outcome from the masterclass paper on 'New Approaches to Funding Research and Innovation in Africa'.

4. Again in Mozambique, the FNI has reinforced the establishment of partnerships and exchange of experience with the SGCs in the region. They have started in-country actions to bring the private sector into the research agenda and have signed a memorandum of understanding (MoU) with in-country National representative of private sector to start a partnership relation for research and innovation. These are outcomes with contributions from the masterclass paper on 'Towards Effective Public-Private Partnership in Research and Innovation'.

5. In Malawi, the National Commission for Science and Technology (NCST) has fostered partnerships with other STI system actors especially with the higher education sub-sector and held for the first time a major national meeting on STI in the country. The masterclass paper on 'Towards Effective Public-Private Partnership in Research and Innovation' contributed to this outcome.

6. In Senegal, the Research and Innovation Directorate has undertaken actions in the country to promote public-private partnership, e.g. the introduction of Board of Directors in universities and opening up of universities and research institutions for enterprise development among others. The masterclass paper on Public-Private Partnership contributed to this outcome.

7. In Botswana, the Department of Research Science and Technology (DRST) is reviewing effective and sustainable approaches for boosting research funds in the country. This came after the lessons learnt from the masterclass paper on 'New Approaches to Funding Research and Innovation in Africa'. The Department is also working with other partners to develop the 'National Private Engagement Strategy' based on lessons learnt from the Public-Private Partnership masterclass paper.

6.   MEETING OF PROJECT OBJECTIVES

Objective	Assessment	Comment
i) Provide an intra and inter-regional platforms for interaction, information sharing, experiential learning, and collaboration among Councils and other science system actors to contribute to the implementation of the African Union Commission's STISA 2024;	4	A total of six (6) interregional events were held, providing the platform for interaction, sharing and experiential learning. Through the execution of this objective, Theme 4 was not only able to promote dialogue on the priority areas for STI, but supported other Themes of the SGCI in building dialogue to achieve their intended objectives.
ii) Commission state-of-the-art and publication quality research papers/ reviews on key STI themes in order to share innovative lessons and good practices, and disseminate knowledge as a global public good; and	4	A total of 11 knowledge outputs were produced from the commissioned state-of-the-art papers. Key policy recommendations produced through this research have been summarized in section 7 of this report.
iii) Support and consolidate the voices and views of Science Granting Councils to effectively contribute to key STI policy debates at the regional and continental levels;	3	More than 6 platforms created by the project enabled the councils to voice their situations, successes and ambitions. It was observed that cultural, linguistic, socio-economic or political differences among the different countries notwithstanding, the aspirations of the continent with regard to STI and development were more shared than different. This allowed for the development of joint projects by the Councils.
iv) Promote and disseminate the scientific work, innovations and technologies produced by Councils to key stakeholders such as policymakers, private sector actors, academia, practitioners, and other key stakeholders in the ARM and AFs.	3	More than 6 platforms created by the project provided the opportunity for the promotion and dissemination of scientific products, processes, and innovations through exhibitions and presentations during the events. Our follow up actions led to the documentation of the knowledge uptake from the project as shown in Box 1 above.

7.   PROJECT OUTCOMES:
I)   CONTRIBUTION TO THE FIELD OF STUDY/RESEARCH AREA
Some of the key recommendations given through the commissioned papers include:

1. Maputo, Mozambique; "**Research Excellence in sub-Saharan Africa"**
   - Science funders should be more explicit in their descriptions or definitions of 'research quality' and 'research excellence';
   - Determining 'excellence' is contingent on appropriate performance standards and benchmarks;

- The appropriateness of a performance indicator depends on its degree of 'usability' and 'user acceptability' in terms of information value, operational value, analytical value, assessment value and stakeholder value;
- Proper understanding and operationalising requires multiple perspectives (both local and global); it is important to make a clear distinction between common global benchmarks and 'local' customised ones.
- Experiences within LMICs in adapting concepts of 'research excellence' and 'research quality' to their local contexts constitutes valuable sources of information to establish good practices in assessment and evaluation practices worldwide;
- Expert opinions from peers should be a prime source of information for value judgements on research quality and excellence;
- Personal views, usually embedded in implicit scientific norms regarding quality standards or driven by selected showcases of successful research, should be complemented by external empirical information to create 'informed peer-review' assessment and evaluation;
- The multidimensional nature of research excellence requires an 'indicator scoreboard' approach, where performance indicators may span the entire spectrum from research resources to socio-economic impacts;
- The choice of performance indicators and/or excellence benchmarks will always be context-dependent and goal-dependent; there is a clear need to incorporate local contextual factors in customised indicators; and
- Frameworks designed to assess research excellence ought to be flexible enough to incorporate changes in the local context and priorities, as well as dynamics of the global science system.

2. Livingstone, Zambia, "**Towards Effective Public-Private Partnerships in Research and Innovation**"
    - **SGCs to Facilitate specific research agenda as a tool for systemic cooperation and learning:** Africa's private sector is quantitatively small, and the science and knowledge system is relatively weak financially and institutionally. Private SMEs engage in atomistic and uncooperative behaviour precisely because of their struggles to deal with daily routines, including non-available public goods taken as parametric in advanced societies. Small actors lack information search capabilities. They need support and interactions with universities, to raise collective productivity, which would have to be facilitated by instruments of policy, as this will not happen spontaneously.

      SGCs need to engage in deliberate creation of capacity strengthening for sectoral interaction mapping and learning as evident in the various European initiatives. Both the inter-disciplinary nature of the scientific and knowledge base as well as the complex processes involved in bringing products inventions from the laboratories to the firm make a range of knowledge interactions critical to competence building at the sectoral level including engaging with, promoting, monitoring and evaluating the knowledge interactions between a variety of different key actors.

    - **Strengthen State institutions for PPP in R&I**: In the developing African environment, research and development institutions and their relationships with firms remain weak and ineffectual. The same applies despite progress over the last decade with having organizations and institutions regulate and coordinate innovation functions, as unfortunately in the 1980s these started to adopt neo-liberal prescriptions in the false hope of market efficiency in the area of R&D. Developing African countries, therefore,

need to approach the task of developing their NSIs with vigour, devoting resources deliberately to key sectors, not to all.

- **Support policy-induced partnerships:** Clearly the paper confirms the significance of network partnerships in promoting innovation as with the European initiatives as well as the more successful cases enumerated in Africa and other regions. PPPs in RI work to generate inter-agent collaborations.

3. Abidjan, Cote d'Ivoire, "**New Approaches for Funding Research and Innovation in Africa**"
   - **How important is the funding of research and innovation among African countries and what is the evidence to demonstrate the level of importance?**
     a. Beyond tactical addressing of current socio-economic challenges, African governments need to develop unifying long-range and operationable national ideologies on the role of research and innovation modelled around the impending demographic dividend and leveraging the continent's unique resource endowment for economic progress. An example is how Japan attained universal health coverage in the early 1960s, way ahead of the rest of the world by defining access to health as a 'nation building' imperative.
     b. As part of their mandate to support and manage research programmes, SGCs should assist researchers to generate research and innovation impact evidence and sustained relevance which will result into political will and commitment to fund research and innovation. There is a lot of data generated by various agencies, e.g. African Science Technology and Innovation Indicators (ASTII), which can be utilized more for decision-making at national and sectoral levels.
     c. For the purposes of defining research and innovation policy objectives and identifying appropriate approaches for funding, it is important for different stages of the research and innovation value to be mapped out (by sector where possible) from basic research to products. This will enable identification of entry points for different funding options. SGCs should lead this as part of their objective to strengthen research and evidence-based policies.
   - **What are the new and innovative funding approaches (schemes, models or mechanisms) that have been applied across the world and what lessons could be drawn for African countries?**
     a. In light of the reality that different countries and sectors may work best with particular funding approaches, there is need for accommodation of diverse funding models and means of optimising and assessing their impact. SGCs and line ministries should work closely to come up with robust procedures for identifying and consolidating desired sector outcomes that policymaking should focus.
     b. Access to and deployment of effective approaches for funding research and innovation require strong leadership and oversight from governments and SGCs, especially with respect to identifying and balancing the disparate requirements of different sectors and areas of application with their points of commonality.
   - **What historical and current factors facilitate or constrain the implementation of the funding approaches and how have/can the gains be enhanced or the challenges resolved?**
     a. SGCs should commission an on-going review of best practice at sectoral, national and international levels to consolidate knowledge about how deployment and implementation of STI policies, research and innovation approaches can be optimised. The review should include the use of existing and new funding approaches, and should include details about how a specific industry or

component of the research and innovation value chain can engage with upstream or downstream processes.

- **What institutional reforms accompanied the new approaches and how could Africa re-position its own institutional architecture for enhanced research and innovation funding?**
    a. Leveraging their access to global knowledge resources, SGCs should help countries develop or reconfigure their STI policies to be not only forward-looking and agile, but also how they influence funding approaches/models and other interventions towards strategic goals. Strategies for funding research and innovation should align with key policies such as national industrial, health, agricultural and education strategies and other national developmental visions.
    b. SGCs should help countries to establish consolidated national knowledge platforms on research and innovation. Generation and sharing of knowledge is integral of research and innovation processes. This can be more cohesively and efficiently achieved within the research and innovation ecosystems and greater benefits will accrue to SGCs, researchers, decision-makers as well as entrepreneurs and actors in the research and innovation systems.
- **How are other broader issues pertinent to research and innovation broadly being taken into consideration towards more efficient and effective funding for research and innovation?**
    a. STI policies and research and innovation funding models will be more effective when underpinned by an understanding of the interdependent political, social, technical and economic factors that affect them. SGCs and governments should use their considerable convening power to regularly bring together research, business, regulator, user and different other communities at national level to explore funding approaches that best promote the values and interests of African countries in a global context.

4. Dar-es-Salaam, Tanzania, **Open science in research and innovation for development in Africa**"
- **Policies and strategies for managing data:** Noting that data is the fuel that drives open science, the delegates called upon African governments to enact and harmonize policies, strategies and incentives for data acquisition, publication, use and disposal.
- **Capacity and infrastructure for computing**: Delegates emphasized the need for enhanced computational ability for the continent to harness the potential for open science. This should be accompanied by skills and capacity enhancement, support for researcher mobility, sustainable funding and creation of accredited data centres.
- **Joint approaches and collective action**: There's need for increased intra-African collaborations in both the generation of knowledge (research) as well as in its application (innovation). Such collaborative action could focus on African grand challenges such as food security, climate change, disease burden etc. or build on on-going continental initiatives such as the African free Continental Trade Area (AfCTA).
- **Community and consensus building**: Continuous dialogue is required to set priorities, goals and ambitions. There's need to create platforms and forums for regular engagement of the different players including public and private sectors as well as the funders.
- **Linguistic and cultural diversity**: Noting that open science is embedded in cultural and institutional contexts characterized by diverse languages – English, French, Portuguese and Swahili as well as numerous dialects – the delegates emphasized the need to harness the opportunities presented by this diversity to promote valorization of research findings, enhance inclusivity and participation.

- **Strategic communication and public engagement**: Communication of scientific outputs to the community was identified as a weak link that undermines uptake of research findings. Delegates emphasized the need to exploit the opportunities under open science to promote sharing of information and strengthen knowledge use.
- **Data ownership, access and ethics**: Create frameworks to guide data ownership and access in collaborative partnerships

II) EXPECTED OUTCOMES VS ACTUAL OUTCOMES

While the Annual Regional Meetings provided a strong avenue for the development of specific themes to be discussed concerning the region's priority STI issues, the Annual Fora and Masterclasses allowed for themed research to be conducted, whose priorities were decided by the councils. The recommendations offered were then communicated to the councils who were to set up institutionalisation strategies for these. All the communication events were planned and executed as per schedule and the expected outcome of these did not vary too much from the actual outcome. However, a recurring recommendation through the years was to set up a more robust monitoring and institutionalisation frameworks, providing more support to the councils. It is recommended that the next phase of the programme proposes more robust structures in support of the councils for better developmental outcomes. Again, it was observed that lots of learning, knowledge sharing and exchange took place during the annual events in form of the AFs and ARMs. There were increased collaborations between and amongst the Councils and other science system actors.

III) UNINTENDED OUTCOMES

One of the unexpected benefits from this project has been the opportunity taken by participating council governments to make key policy statements relevant to STI development in their countries. For instance: during the 2018 ARM, one of the key messages from the meeting as delivered in the keynote address of the Minister of Environment, Science Technology and Innovation, Republic of Ghana was, "The government has decided to raise the level of funding for research and development on STI. Mr Chairman to this end, the President has pledged that the rule of 1% towards GDP will be applied to STI in this country beginning this year; and this amount will be increased to 3% of Ghana's GDP progressively."

8. MEETING THE SGCI 2020 LOGICAL FRAMEWORK TARGETS:

Indicators	Milestones (March 2020)*	Provide updates/ comments
Output Indicator 4.1		
Number of knowledge outputs on research system strengthening in East Africa (e.g. political economy analysis; research synthesis; commissioned studies) (All CTAs)	At least **8** knowledge outputs produced **(at least 4 new outputs required by March 2020)**	1. Oyelaran-Oyeyinka, B. et al, 2018, Towards Effective Public-Private Partnerships in Research and Innovation: A Perspective for African Science Granting Councils; African Technology Policy Studies Network (ATPS), *Technopolicy Brief No 49.* 2. Oyelaran-Oyeyinka, B. et al, 2018, Towards Effective Public-Private Partnerships in Research and Innovation: A Perspective for African Science Granting Councils; African

Technology Policy Studies Network (ATPS), *Research Paper No 29*.

3. Bertha Vallejo & Banji Oyelaran-Oyeyinka & Nicholas Ozor & Maurice Bolo, Public-Private Partnerships in Research and Innovation: Opportunities and Barriers for African Science Granting Councils, I*n Press.*

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6. Mugwagwa, J. et al, 2019, New Approaches for Funding Research and Innovation in Africa, African Technology Policy Studies Network (ATPS), *Research Paper No 30.*

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		G, (2020) *Building Science Systems in Africa: Challenges and Opportunities for Science Councils; In Press*
Output Indicator 4.2		
Number communication (i) outputs and (ii) events on what works on research system strengthening (All CTAs)	At least 5 communication events held and at least 3 policy briefs produced (**At least 1 new** policy brief required by **March** 2020)	• **Three (4) Annual Forums namely:** 1. Maputo, Mozambique; "Research Excellence in SSA**"** 2. Livingstone, Zambia, "**Towards Effective Public-Private Partnerships in Research and Innovation**" 3. Abidjan, Cote d'Ivoire, "**New Approaches for Funding Research and Innovation in Africa**" 4. Dar-es-Salaam, Tanzania, **Open science in research and innovation for development in Africa**" • **Two (2) Annual Regional Meetings** 1. Kigali, Rwanda, "**The First Annual Regional Meeting of the Science Granting Councils Initiative in sub-Saharan Africa**" 2. Accra, Ghana "Research, "**Research and Innovation for Job Creation"** • **Three (3) Policy Briefs (communication output)** 1. Oyelaran-Oyeyinka, B. et al, 2018, ***Towards Effective Public-Private Partnerships in Research and Innovation: A Perspective for African Science Granting Councils***; African Technology Policy Studies Network (ATPS), *Technopolicy Brief No 49.* 2. Mugwagwa, J. et al, 2019, ***New Approaches for Funding Research and Innovation in Africa***, African Technology Policy Studies Network (ATPS), *Technopolicy Brief No 50.* 3. Boulton, G., Loucoubar, C., Mwelwa, J., Ozor, N., and Bolo, M. (2020) Open science in research and innovation for development in Africa; *ATPS Research Paper No. 32.*

9. KEY LESSONS/ OBSERVATIONS FROM THE PROJECT:

The Communication Events held during the SGCI Phase 1 offered great opportunity for learning, sharing, networking and excitement. There were many opportunities for stakeholder engagements and interactions in discussions on the chosen themes for the Masterclasses and Annual Regional

Meetings (ARMs). Most importantly the increased voices given to the SGCs and other science system actors during these events made it possible to identify unique features of the participating Councils, what works and what doesn't and why. The lessons learnt will go a long way in supporting research and evidence-based policies that will contribute to economic and social development in the target countries.

Selected observations/lessons learned in the course of the project include:

- **Oversight functions on the commissioned paper** – we recognize out from experience that the project team needs to commit more time in following up with the author(s) of the masterclass papers once it is commissioned. This will of course increase the required staff time allocation of the project team to the project and we will appreciate an upward review of the staff time allocation to the project team. We have deployed approaches such as fortnightly meetings (physical and by Skype), telephone exchanges, emails and conference calls with the author(s) to ensure that a quality masterclass paper is produced and presented during each annual forum event.

- **Set a manageable number of presentations and ensure selection of good facilitators-** During the annual forums, we ensured that only few presentations were made to give room for discussions on the masterclass paper by the delegates particularly the Councils. This enabled inputs by selected HORCs in providing insights from their country's experience, plans and activities. The inputs from the consultants and other stakeholders usually garnished the masterclasses to a super event and provided more avenues for the delegates to engage in participatory discussions on the paper. The Facilitator's role during the masterclasses contribute significantly to its success and hence ensuring that good facilitators are engaged at each annual forum to facilitate the forum events is of utmost importance.

- **Other logistical issues** – Planning adequately in partnership with all the relevant actors and partners ahead of each annual event for all logistical items have been the secret of our success in all the AFs and ARM that we have organized.

- **Opening Ceremony**- -Ensure that protocols are duly observed during the opening ceremonies and masterclass events. Time is of essence and this has to guide the planning for the event. Gender balance has to be maintained at all times to ensure that both men and women are given equal opportunity during the opening ceremonies.

- **Increasing SGCs voices during the annual forums** – it has been found to be very useful to give more voices to the SGCs during the annual forums. This way, they have their voices heard and feel ownership of the initiative. It becomes more useful if specific Councils are identified to reflect and give perspectives on issues drawn from the masterclass paper that has direct relevance with their Council's programmes and activities.

- **Change of guards at the Councils** – we recognize the constant change of guards in the leadership of the councils and commissions in the participating countries and recommend that all HORCs and Coordinators prepare and share proper SGCI documentations in their respective councils/commissions/ministries to make for easy handover to new personnel when such cases arise. There should be post annual forum workshops or seminars at each council, commission or ministry to update other staff within the organization on the outcomes from the annual forum and lessons for each of the councils, commission or ministries. This way, more personnel within the participating organizations are kept abreast of the initiative.

- **Consultation with HoRCs in delegating SGC Coordinators** - there were cases of absence of some Coordinators during ARM and AFs which were occasioned by lack of approvals by the HoRC in-charge. While the specific issues around the disapproval were not usually given, it is recommended that the selection of SGC Coordinators that will participate during SGCI

meetings be done in consultation with the HoRCs ahead of time. This fact notwithstanding, it is important to advocate that participants during the AF/ARM events share the outcomes of the meeting with their organization to keep them abreast with the SGCI events. This way, any change in leadership or representative will not be drastic to the country's SGC.

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• Translation of knowledge products to other languages: Since adopting the practice of translating key knowledge products into English and French, there have been increased interest by the Councils and other science system actors to consume the products.

10.   GENDER/ INCLUSIVITY AND ETHICAL CONSIDERATIONS:

The project ensured a gender balance in the implementation of the project. The project team had female members who are in charge of financial management, communications and technical coordination. The project continued to remain conscious of ensuring a gender balance in selection of representatives for the annual forum, the facilitation roles such as session chairs, rapporteurs etc. The implementation of the project was inclusive, with active participation of both project partners.

For instance:

• During the 2017 AF, a total of 40 female delegates and 80 male delegates attended.
• During the 2018 ARM, a total of 13 female delegates and 27 male delegates were invited.
• During the 2019 AF, a total of 89 females and 149 males attended.

The selection of speakers during the Forum was also consciously done to accommodate both men and women equally. For instance women usually constitute over 50% of the HoRCs that give perspectives to the masterclass papers.

The implementation of the project has also been inclusive, with the active participation of project partners. Different tasks have been shared among implementing partners, with each partner serving as a backup reviewer of each other's executed tasks. The complementarity approach enhances the quality of the project deliverables and also fosters the relationship between the project partners.

For instance, while ATPS handled most of the logistical issues relating to the delegates' participation in the annual forum, the Scinnovent Centre led in the drafting of the Concept Note for the Annual forum bordering on PPP that was held in 2017. Both ATPS and the Scinnovent Centre independently reviewed all the expressions of interest submitted by the potential authors and submitted scores that were collated to appoint the authors who won the bid.

The complementarity approach adopted by ATPS and Scinnovent Centre in the implementation of our Theme 4 project enhanced the quality of the project deliverables and also fostered the relationship between the project partners.

In 2019, the SGCI and the Global Research Council jointly organised the Gender Session which was an opportunity to speak on the specific gender issues that affect the councils and other science system actors present. Some of the key observations made during this session include: SGCs are increasingly enacting policies and strategies to promote the status and equality of women in research; The number of female researchers in many Sub Saharan African countries continues to be low; Diversity approaches are being explored; Greater support is needed for the SGCs; Storytelling is a powerful tool to encourage and influence action; Challenges regarding gender and inclusivity are experienced by funding agencies globally; and, for inclusivity, the human rights discourse is a powerful approach.

11.   OVERALL ASSESSMENT AND RECOMMENDATIONS:

The implementation of the Theme 4 of the SGCI Phase I Project, "Building Partnerships and Networks among Science Granting Councils and Other Science System Actors in Sub-Saharan Africa," was excellent and a very big success. The project delivered more than expectations in all the targets that

were set in the logframe and outputs from the project. Above all, the evaluation reports consistently show that the SGCI delegates were very satisfied with the planning, execution and outputs from the Theme 4 project. They have called for the sustenance of the Initiative and the engagement of professional CTAs such as the ATPS to implement programs of the SGCI with particular reference to Masterclass events, monitoring knowledge uptake and other stakeholder engagements.

Open Science in Research and Innovation for Development

Annual Forum of the Science Granting Councils Initiative (SGCI), 2019

Summary of Key issues and resolutions

The Science Granting Councils Initiative (SGCI) aims to strengthen the capacities of science granting councils in sub-Saharan Africa to support research and evidence-based policies that will contribute to economic and social development. The Initiative is jointly funded by United Kingdom's Department for International development (DFID); Canada's International Development Research Centre (IDRC); South Africa's National Research Foundation (NRF) and the Swedish International Development Cooperation Agency (SIDA). The Initiative currently works with 15 African Countries including: Botswana, Burkina Faso, Cote d'Ivoire; Ethiopia, Ghana, Kenya, Malawi, Namibia, Mozambique, Rwanda, Senegal, Tanzania, Uganda, Zambia and Zimbabwe.

The Initiative convenes high-level Annual Forums that bring together the participating Councils with other science systems to deliberate on key topical issues of strategic importance to the Councils and national development as well as to enhance African voices on regional, continental and international policy debates.

In 2019, the theme for the Annual Forum was, "Open Science in Research and Innovation for Development." The following are key issues and resolutions from the SGCI Annual Forum.

- The delegates observed that Open Science is not a new concept in Africa, and that some of its components are already being practiced by African researchers and institutions in areas such as open access publications. However, the emergence of 'research as an enterprise'; the new general-purpose technologies and new priorities for development have brought new dimensions to open science approaches.

- Delegates further observed that African Science Granting Councils are already working collaboratively in bilateral and multi-lateral cooperation, sharing resources, infrastructures, skills and capacities. These collaborations promote openness and in some cases have led to peer – to – peer learning, experience and knowledge sharing and replicability.

- The delegates noted that the transition to a "knowledge society" where productivity and innovation would be hinged more on knowledge – its generation and application – and less on natural resource endowments.

- This transition is underpinned by the digital revolution as a key enabler of open science. However, the digital revolution also leads to a "Tsunami of Information" – its acquisition, storage, manipulation and potential for applications is ubiquitous.

- To be relevant and useful, the delegates noted that information needs to be released to society in a comprehensible form. This requires positive mutual engagement with society.

- Delegates also noted that development challenges are complex and characterized by emergent behavior. It is not easy to predict future outcomes based on current events hence the need for society to accept and organize to mitigate the associated risks.

Welcome Addresses

Amos Nungu, COSTECH, Tanzania

Eunice Muthengi, East African Research Hub, UK Department for International Development

Dr Amos Nungu in his welcome remarks noted that the precepts of Open Science (OS) have been documented in the masterclass that was shared by the research team, and that the SGCs should be able to facilitate the process of OS in their respective councils, as well as choose the media that is able to promote the different components of OS, i.e. open publishing, open access, open source, among others. He recognised that the Masterclass Session allows for discussion and appreciation of what it takes to adopt OS and called on all the participants to chime in, and look forward to sharing within and between the institutions present, which should be fostered more. "Currently, we are all aspiring towards the SDGs, which modestly require the application of OS, and when we talk of ST&I for the SDGs, OS provides the solutions we are looking for. If a researcher in Kenya for instance is researching on something and a person from Uganda is not able to replicate, the Kenyan people may be able to address solutions for the developmental challenge, while we shall have to get more funds to do the same research in Uganda to solve the same kind of challenge. But if the process is open, then the solutions can be applied in Uganda, in Rwanda in South America, sharing best practices among the councils."

In her remarks Eunice Muthengi started by checking the temperature in the room on those who understood OS (hot), those who did not fully understand what OS is about (lukewarm) and those who felt that OS is a far-fetched dream (cold), finding out that most of the room was lukewarm. Evoking the need for OS based on her own research experience, Dr Muthengi mentioned that she was glad funders are taking the decision to support OS publishing platforms. DFID recently performed a review of their OS policies, found that it was similar to that of other funders but that there was room for improvement. They are viewing their policies, and have endorsed PlanS, a coalition of 13 European funders including the UKRD and they are making the transition to adopt and open publishing model, while recognising that open access is just one of the elements of OS. Some of the questions they have been asking with regard to OS for R&I in Africa are, "Does OS increase marginalisation or does it bridge the divide? How do we ensure that OS benefits excluded groups?" These are some of the questions that they expected the Masterclass is able to address, and that the cold and lukewarm teams are able to find answers to those questions. DFID and other funders are looking into the SGCs to get the direction of travel for OS for Africa, so that they can continue to look at their policies and procedures to make sure that they are supporting the needed causes.

INTRODUCTION TO THE SESSION AND THE MASTERCLASS PAPER AUTHORS

***Nicholas Ozor**, African Technology Policy Studies Network (ATPS), Kenya*

Dr Ozor recognised that the themes of the SGCI Masterclass sessions, which have happened for the last four (4) years are direct recommendations of the Science Granting Councils on topical issues that are important to them and other science system actors, so as to foster their mandate. Once a topic is selected, the commissioning team engage with experts and professionals in the field within and outside Africa to ensure that the topic gets the best team to discuss and provide information around the chosen thematic area. He then presented the authoring team of the Masterclass of the day, including Prof Geoffrey Boulton, University of Edinburgh and Joseph Mwelwa, Joint Minds Consulting, Botswana.

PRESENTATION OF MASTERCLASS PAPER: OPEN SCIENCE IN RESEARCH AND INNOVATION FOR DEVELOPMENT

***Geoffrey Boulton**, University of Edinburgh, Scotland*
***Joseph Mwelwa**, Joint Minds Consulting, Botswana*

The Knowledge Economy & Open Science

The knowledge economy was presented as the basic economic resource, quoting Peter Drucker, 1969, ""The basic economic resource – the means of production, to use economists' terms – is no longer capital, nor land, nor labour. It is and will be – knowledge." The knowledge economy is powered by the digital revolution which grew principally from the 1980s and provided a tsumani of information in the current age, building the information society which is characterised by applications including uniquitious communication, the web, computation, machine learning and blockchain.

Open Science has taken a new form, "If you have an apple and I have an apple and we exchange these apples, then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have two ideas" (George Bernard Shaw). OS is an umbrella concept/philosophy which has underneath it concepts of Open Data, Open Access to Scientific Publications and Open to Society.

A Scientific revolution

The scientific revolution is driven by broad data, and without open data, there is no board data. Broad data builds complex patterns in nature and society, where the whole is the sum of the parts, without planning the emergent pattern. Science 50 years ago, we were been able to simulate system dynamics and now we are able to map complex states thanks to availability of data. We can now analyse complex systems in a way that we have not been able to before. Most global challenges are embedded in "complex" systems. The other revolutionary development is machine learning where algorithms are applied e.g. when geologists involved in the predication of the North Atlantic Ocean Circulation.

The principle opportunity for modern science is complexity, while its principle challenge is sustainability. E.g. in neural applications, the relationship between the neural interface and artificial intelligence can be used in specific applications such as memory, concentration, ageing and hands free control, inverting the cognitive cycle, albeit with ethic concerns. Science and technology are racing forwards and taking economies with them, where data produces complexity and human enhance applications.

Why does it matter for Africa?

Open Science is a key enabler of the 4th Industrial Revolution (4IR), while we cannot reap into the benefits of the 4IR without the infrastructure that allow you to benefit from it. For instance, the success of the AfCFTA will depend on its performance in this revolution and the success in this revolution will depend upon Africa's relevant S&T base, hence the debate on whether the applying the 3rd Industrial Revolution (3IR) is much easier than the 4IR.

However, all technologies have a dark side, however, we can mitigate the risks by understanding where the dark comes from, often in the form of spreading lies, political manipulation, invasion of privacy, cyber-crime, cyber-welfare, displacement of humans, and existential risks. Society must equip itself with the skills to avert these risks.

The Open Science Tooklit

The Open Science toolkit is composed of data management, understanding open data priorities, and open communication and engagement.

On data management, a lot of data is being produced and the SGCs must start developing systems to manage the data, which requires the understanding of the data life cycle and its specific capacities needs (data management planning ➔ active data management ➔ appraisal & risk assessment ➔ data preservation). In addition, to act in the OS space, Africa needs to meet the global standards, by having the data management systems acquiring the Core Trust Seal of approval. Currently, there is only one (1) data management firm that has obtained the seal of approval (Data First, South Africa). This means that there is a model already that the SGCs could look to in case they want to develop such standards data management systems. The Institutional Repository (IR) lists about 165 institutions from African countries: Eastern Africa-60, Middle Africa-1; Northern Africa-30, Southern Africa-44, and Western Africa-30). Crucially, the Academy of Science for Africa (ASSAf), in collaboration with the Association of African Universities (AAU), have developed IR criteria for a trusted IRs.

On the open data priorities, there is need to understand the purpose of open data, the required infrastructure, good open data practices and the shared principles involved in open science. One of the principles that defines the purpose is that Africa should become a leader in OS, in order to produce contextual knowledge. In addition, there is need to create a critical mass, produce skilled people, stimulate innovation and become a data rich continent. When thinking about shared principles, we need to ask ourselves about thelimits of access, regulations and standards, ethics, and efficient licensing/copyright. On infrastructures, we need to think of: high performance computing, cloud computing, broadband networks, trusted data centres, machine learning & analytics, and   societal portals, among others. On good open data practices, we need to think of among others FAIR (Findable, Accessible, Interoperable, and Reusable.

The Ebola Crisis is an example of a complex issue that is still being addressed through OS. Unfortunately, Africa are participants in the challenge: after the challenge is solved, all the data is taken away from the continent. In the event of a resurgence, Africa may not be able to address this same challenge effectively, hence the need to have leadership in OS.

On open communication and engagement, its purpose should be guided by purpose, e.g. sharing scientific results with all at affordable costs and jointly creating actionable knowledge with all societal stakeholders. Its principles could be that knowledge has to be accessible and comprehensible to all wishing to use it, and that scientists must publish the evidence (data) in the fullest way for any published claim.

Case examples given of anecdotal evidences OS practices in Africa include: Ethiopia launched their Open Data/Access policy where all the universities will have their data open for all research conducted using public funds; Tanzania has D-Lab that is promoting OS; South Africa has a policy as well as the square kilometre area (SKA); Botswana have its open data forum that allows for interactions between governments and stakeholders; Senegal is part of the H3 Bioinformatics framework; Zambia is a member of PlanS-the only country in Africa that has signed up for PlanS; Burkina Faso has a Government Open Science Website where public data is freely available, in addition the Agridata-BF is an initiative that uses four (4) local languages and they distribute climate smart data to farmers and the SGCs can learn from this initiative; Egypt has launched the Egyptian knowledge book where paywalls are removed for research conducted by Egyptians; and the African Open Science Platform. The current international publishing model does not favour Africa, and it is not going to favour open access and OS.

An Efficient Open Science Ecology

The H3ABioNet Informatics network was presented as a model for open science, a pan-African informatics network that provides bioinformatics infrastructure and supports the H3Africa Consortium. Borrowing

from this model, the goal is to set up platforms comprising of data bases, biomatics, interoperability structures and industry orientation.
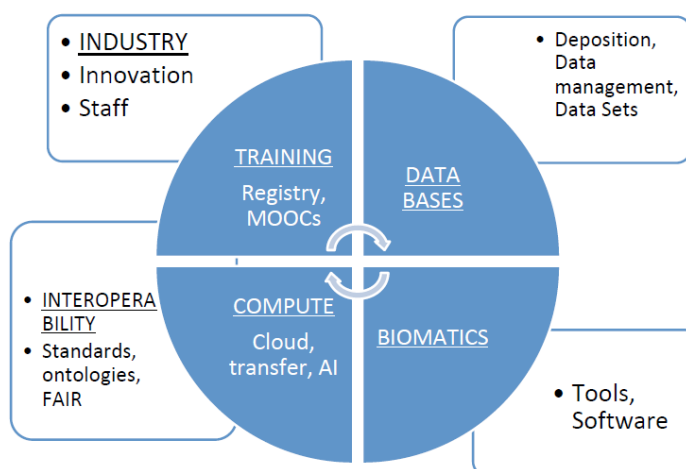

Figure 1: The Operational Goal is to Setup Platforms

However, this looks like an uphill battle being aware of the challenges present, where there is unawareness of the challenge, lack of political leadership, inadequate science investment, poor ICT connectivity, obsolete equipment, scarce high performance computing (HPC) facilities, a lack of training opportunities and a lack of secure data storage.

Possible Roles for SGCs

The STISA 2024 report presents some structural issues including low rates of knowledge development (0.74% of global, few critical masses and low intra-Africa research collaboration. The priority roles of the SGCs therefore is to: use their unique intermediary position to influence and be influenced by mobilising resources, and creating scientific communities in ensuring their effective utilisation; use their potential to tap into collective actions; and make the case with their governments for OS.

The recommendations issued to the SGCs through this report include:

- They should choose their levels of ambition;
- Commission expert reviews; and
- Build consensus with key players.

There is need to mobilise the right mind-set, rather than more funding. Africa has everything it needs, in real terms, borrowing the words of President Paul Kagame. With such ambitions, the view from the top would change, where we have efficiencies of scale, build collaborations, scale-up through shared capacities, create through diversity, and amplify impact though common purpose and voice.

OPEN SCIENCE IN RESEARCH AND DEVELOPMENT: SGCS' PERSPECTIVES AND RESPONSES

Facilitator: **Teboho Moja**, New York University, USA
Susan Muzite, Research Council of Zimbabwe
Hamidou Tamboura, Fonds National de la Recherche et de l'Innovation pour le Développement, Burkina Faso
Annette Ouattara, Programme d'Appui Stratégique à la Recherche, Côte d'Ivoire
Dirce Madeira, Fundo Nacional de Investigação, Mozambique

Having heard the propositions put forward through the Masterclass presentation, selected African SGCs were called upon to offer their perspectives on OS, based on their experiences in their countries.

Susan Muzite, Research Council of Zimbabwe - Zimbabwe

The Research Council of Zimbabwe has been promoting scientific and technological capabilities of institutions and individual scientists to solve the development problems of Zimbabwe and is fully committed to open science in research and innovation for development. However, evidence seems to show that Research Data Management, as an integral part of the open science ecosystem needs capacitation and strengthening to enable the Council to manage the science systems more effectively.

On Zimbabwe's experience on OS environment, the question was posed on what their priorities are in setting up national data management centre(s) that promote FAIR data in OS, and whether such centres would require articulation to regional data management centres. Ms Muzite confirmed the country's commitment to transformatively scale, with respect to development of women's capacity, and with respect to investing in infrastructure for OS platforms. In May 2019, the GRC had a meeting in Sao Paulo where the AOSP together with four other major worldwide OS initiatives issued a statement on OS to make sciences readily available as a public good. In Sep 2019 in Cairo, Egypt the AOSP designed implementation proposals. Zimbabwe is still at the level of active dialogue with stakeholders including researchers, universities and others including government. They are advocating for an agency to come up with state recommendations. Therefore, the RCZ looked forward to deliberate with other SGCI partners on how to move forward with the OS agenda. RCZ is committed to move with others with respect to capacity building, infrastructure and implementation.

On institutions, Zimbabwe is setting up a geo-spacial and space agency for data collection. Some of the areas where the agency would intervene include application of fertilisers with precision,a mong others.

Annette Ouattara, Programme d'Appui Strategique a la Recherche Scientifique – PASRES

Sub-Saharan Africa is home to four non-African languages, English, French, Portuguese, Arabic and many African language groups. An open science initiative will need to take this issue seriously, partly because much of Africa's meaningful production of knowledge for innovation cannot be readily separated from its indigenous linguistic and cultural contexts.

On how the Strategic Support Program for Scientific Research (PASRES) can help promote production of knowledge for innovation and development that reflect Cote d'Ivoire's indigenous and linguistic contexts in the proposed Open Science eco-system, Dr Ouattara responded that the first mandate of PASRES is to facilitate the knowledge production for innovation. She first remarked that the production of formal knowledge is done in only one language, French, while the local languages are isolated. Secondly, OS is a relatively new concept in Cote d'Ivore where knowledge diffusion is still done through traditional through scientific publications. Scientific communication is done by scientists addressed towards their fellow scientists, of which what is considered important is academic acknowledgement among peers. In the perspectives of promoting OS in R&D in Cote d'Ivoire, PASRES could first of all work to promote an ecosystem that is compatible with the OS system. It would be important to reinforce the communication systems for better connectivity. Following this, PASRES could work towards setting up a legal and regulatory system well adapted to manage researchers' intellectual properties and facilitate access to knowledge. In addition, the system put in place through OS needs to take into consideration scientific requirements. PASRES could also include in its contracts a clause that obligates at least one publication to be made open access for any work that has been done through PASRES financing. On the generalisation of their

Would this work for other Science Granting Council member states? Would this help to make science more inclusive in Africa? Does the PASRES see a strategic role for the Centre for Advanced African Studies (CASAS) in Cape Town (South Africa) in providing language research capacity support to the Science Granting Councils in Africa? What role can African universities play to promote indigenous languages as mediums for knowledge and innovation production and dissemination on the Internet in an open science ecosystem?

- o Q: How can PASRES help promote the production of knowledge that reflects indigenous, linguistic contexts

- A (French): I am Ouattara, responsible de. La premiere mission du PASRES. Il est bon de noter 2 choses. Le francais est le plan…les langues natales ne sont pas. La diffusion de
- A (English) : We can produce knowledge in one language and diffuse this in more languages

Dirce Madeira, Fundo Nacional de Investigação, Mozambique

Background: In the promotion of scientific research for innovation and development in Mozambique, the Fundo Nacional de Investigação, has to deal with the complexities of Mozambique's official language systems of Portuguese and English, which are not only visible in the country's economic and political systems, but in social landscapes such as education. With particular reference to education, the science system is built on the Portuguese language and is presumably being transferred to English to align with the majority of science systems in the other Science Granting Council member countries. Added to this, there are several indigenous languages that are widely spoken by the people of Mozambique.

Question: What would be the linguistic challenges of Fundo Nacional de Investigação, in advocating and implementing open science in Mozambique? How would the Fundo Nacional de Investigação promote open publishing and open access given these linguistic complexities? What role should the indigenous languages play in open science in research and innovation for development in Mozambique and in a possible open science area amongst the SGCs? To operationalize open publishing and open access in Mozambique, which of the two proposed publishing routes;- Gold and Green would be favoured? What is the reason for this?

Dirce Madeira

- A: Portuguese is the official language of Mozambique
- A: It is necessary that Portuguese be made a language of science

Hamidou Tamboura, Fonds National de la Recherche et de l'Innovation pour le Développement, Burkina Faso

Background: The National Fund for Research and Innovation for Development of Burkina Faso has made significant progress on open science for innovation and development. For example, Burkina Faso's open data platform provides the public with reusable data from public administration, the private sector and civil society. Furthermore, the research competence center (CoC) of the West African Science Services on Adapted Land Use (WASCAL) is based in Ouagadougou (Burkina Faso) enabling the National Fund to coordinate, through its local agencies, activities between West African States and other international organisations such as the Global Open Data on Agriculture and Nutrition (GODAN) as part of the Africa Geospatial and Internet Conference.

General discussions

Toboho: Is open science the key?

- Muzite: it links availability of data, emergence of new systems to solve bread and butter systems. Meeting of minds to motivate funding on all levels
- Dirce: it raises more funds for research but brings what researchers need the training and capacity to do better research
- Annette: si les résultants scientifiques sont diffusée vers le grands publics, cela permettra d'accroitre le financement (if the scientific results are disseminated to the general public, this will increase funding).

Toboho : what kind of collaborations are needed ?

- Si les données générées ne sont pas communiquées…donc on ne peut pas. S'il n'y a pas de culture de communication…il n'y a pas d'infrastructure de base….on ne peut pas (If the data generated is not communicated and there is no basic infrastructure, we cannot collaborate)

Toboho : Who is connecting with regional data management centres?

- o Muzite : They support the African platform
- o Hamidou: nous avons mis en place une plateforme qui mettra en place des individus… (we have set up a platform of individuals)
- o Annette : le secteur privé peut avoir des (the private sector can)

Toboho : with the scientific revolution there is a lot of anticipation. What is your one main concern given the dark side of Open Science?

- o Annette: researchers should be ready to share the results of their research with the others

FACILITATED DISCUSSIONS ON THE MASTERCLASS PAPER BY MR. ALFRED SUMANI, NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY, ZAMBIA AND ALDO STROEBEL, NATIONAL RESEARCH FOUNDATION, SOUTH AFRICA

A general dialogue on Open Science (OS) in research and innovation for development that followed showed that delegates were very enthused with the concept and are willing to learn more about it with the hope of deploying aspects of the OS in their respective Council's operations. Some key issues that were highlighted during the facilitated discussion session are described below:

- All aspects of knowledge can fit into open science especially when it can be useful to the society. Nevertheless, both public and private goods are derived from knowledge and can influence how knowledge can be made open.
- For open science to become effective and efficient in Africa, there is need to invest in data, infrastructure, funding, human resources and capacity building at all levels.
- There is need to set up guidelines and incentives for open science to work. A researcher must know his gain in sharing his data with an outsider for there to be a mutual benefit and cooperation.
- There is need to package the concept of open science to benefit the youth and women who may eventually become vulnerable in getting access to data and information as the case may be.
- The extent of being open in an open science era calls for what can be made open and what cannot be made open depending on the sensitivity of the data or information.
- The issue of ethics is fundamental to open science.
- There is need to mount open science campaigns across the SGCs and other science system actors to make them fully aware of the concept and its operations as well as get adequate buy-in from the stakeholders.
- The open science agenda will lead to a facilitated and enhanced knowledge production considering that inventors and researchers most times will not have to re-invent the wheel again because there is available data and information to use as a benchmark.
- Considering that the open science concept is new, there is great need to grow a new crop of researchers that will embrace the new concept, popularise and adopt it in their operations.
- In order to institutionalize open science, there is need to promote policies in favour of open science just like we have in other advanced countries such as United Kingdom.
- All data and outputs from publicly funded research should observe the standard operating procedures of open science.

KEY RECOMMENDATIONS

Noting that Open Science presents an opportunity to address the complexities of development, the delegates resolved as follows:

- **Policies and strategies for managing data:** Noting that data is the fuel that drives open science, the delegates called upon African governments to enact and harmonize policies, strategies and incentives for data acquisition, publication, use and disposal.

- **Capacity and infrastructure for computing**: Delegates emphasized the need for enhanced computational ability for the continent to harness the potential for open science. This should be accompanied by skills and capacity enhancement, support for researcher mobility, sustainable funding and creation of accredited data centres.
- **Joint approaches and collective action**: There's need for increased intra-African collaborations in both the generation of knowledge (research) as well as in its application (innovation). Such collaborative action could focus on African grand challenges such as food security, climate change, disease burden etc or build on on-going continental initiatives such as the African free Continental Trade Area (AfCTA).
- **Community and consensus building**: Continuous dialogue is required to set priorities, goals and ambitions. There's need to create platforms and forums for regular engagement of the different players including public and private sectors as well as the funders.
- **Linguistic and cultural diversity**: Noting that open science is embedded in cultural and institutional contexts characterized by diverse languages – English, French, Portuguese and Swahili as well as numerous dialects – the delegates emphasized the need to harness the opportunities presented by this diversity to promote valorization of research findings, enhance inclusivity and participation.
- **Strategic communication and public engagement**: Communication of scientific outputs to the community was identified as a weak link that undermines uptake of research findings. Delegates emphasized the need to exploit the opportunities under open science to promote sharing of information and strengthen knowledge use.
- **Data ownership, access and ethics**: Create frameworks to guide data ownership and access in collaborative partnerships

APPENDIX 2: PROCEEDINGS OF THE 2019 SGCI MONITORING, EVALUATION AND LEARNING (MEL)

Introduction and objectives of the session
Ellie Osir, Canada's International Development Research Centre (IDRC), Kenya

Monitoring, evaluation and learning (MEL) remains a key component of the SGCI. The MEL workshop session provided ample space to take stock, reflect, share knowledge and learning, and exchange ideas and innovations in the implementation of the initiative.

Guiding this objective was the SGCI theory of change that traced the pathways to achieving the anticipated outcomes, including sharing lessons by the collaborating technical agencies (CTA) and the SGCs. Different facilitation techniques were adopted to ensure that the sessions remained as interactive and participatory as possible.

For example, a World Café session was conducted to give participants a chance to engage with the various CTAs across the different thematic areas. To reiterate the importance of MEL within the initiative, the SGCs had an opportunity to reflect and share on their role in MEL moving forward and how the MEL process could be more efficient and effective. The key objectives of the MEL session were:

• Better understanding of achievements in SGCI 1 against the theory of change

• A shared understanding of the role of SGCs in MEL and how this can be strengthened for it to be more participatory, effective and efficient.

Ellie Osir of Canada's International Development Research Centre (IDRC) Kenya, opened the session by underscoring the importance of the MEL session in the larger framework of the SGCI. He further added that the objectives of the workshop were, to showcase the work of the SGCI against the Initiative's theory of change (ToC), engage in other communication forums such as World café, video films, fish bowl, presentations, updates on monitoring, evaluation and learning (role of Councils in MEL process), and progress on Phase II of Political Economy Analysis (University of Sussex) (UCL).

He further said that the main goal was to share and learn how the SGCI is making a difference in Africa. He noted that it was not a one day affair but rather work in progress. He also underscored the underfunding of science related initiatives by African governments.

Ellie went on to mention that strengthening of science systems in Africa was very vital if at all development was to be achieved. He further mentioned that any science system has certain components to various actors (individuals, organisations).

Ellie submitted that that science systems cannot work if there is corruption in the system.He added that developed countries had achieved monumental proportions of development as they made sure that educational policies were polished before being brought into matters on STI.

> **Session 1: World café by CTAs**
> **Key outcomes and lessons learnt in SGCI implementation**
> **Facilitator: Diakalia Sanogo, IDRC, Senegal**
> **SGCI Theme 3: Film projection (In Plenary)**
> - **Southern African Research and Innovation Management Association (SARIMA), South Africa**
> - **New Partnership for Africa's Development – Planning and Coordination Agency (NEPAD-NPCA) - South Africa**
> - **ACTS, Kenya**
> - **Scinnovent Centre**
> - **African Technology Policy Studies Network (ATPS), Kenya**

African Technology Policy Studies Network (ATPS)

The African Technology Policy Studies Network (ATPS) as a CTA under theme Four on "Strengthening partnerships among SGCs and with other science system actors" presented its report to the forum. The objective under this theme was to provide platforms to increasingly coordinate and network the Science Granting Councils and other science system actors in Africa. The background on this was to share knowledge and experiences as well as learn from each other for increased uptake of knowledge outcomes in the respective Councils and science systems as well as enhance research excellence in Africa, promote effective public-private partnerships as well as look into new approaches for funding R&I .

ATPS submitted that Four Annual forums were held in Mozambique, Zambia, Cote d' ivoire and Dar es Salaam. Each of these forums had a theme. In Maputo, the theme was "Research excellence in Africa: policies, perceptions and performance while in Livingstone, Zambia, it was on "Towards Effective Public-Private Partnerships in Research and Innovation". In Abidjan, Cote d'Ivoire, it was on "New Approaches for Funding Research and Innovation in Africa" while in Dar-es-Salaam, Tanzania, it was on "Open Science in Research and Innovation in Africa". In addition to that, two Annual Regional Meetings were held. The first one was in Kigali, Rwanda, "The First Annual Regional Meeting of the Science Granting Councils Initiative in sub-Saharan Africa" while the second one was in Accra, Ghana under the theme "Research and Innovation for Job Creation". Two case studies were explored under the theme of Political Economy and Public-Private partnerships. Under Political Economy theme, the Uganda National Commission on Science and Technology (UNCST) had revised the national research guidelines to include windows of support for social innovations: platforms for academia-industry research collaboration and for greater alignment with regional (STISA) and global Agenda 2030 for development strategies. Under the second theme, FNI has signed a MoU with the country National representative of private sector to start a partnership relation for research and innovation." Lastly, ATPS mentioned that the outcome of all this is effective Science Granting Councils that will strengthen national science systems, and lead to nationally led research that contributes to development in sub-Saharan Africa.

African Centre on Technology Studies (ACTS) and Science, Technology And Innovation Policy Research Organization (STIPRO)

The African Centre for Technology Studies (ACTS) as a CTA under theme Three "Strengthening Partnerships among Africa's Science Granting Councils (SGCs) and the Private Sector" together with Science, Technology and Innovation Policy Research Organization (STIPRO) made a presentation on this theme. The key objectives were to strengthen the ability of SGCs to design and manage collaborative agreements with each other; to strengthen the ability of SGCs to manage cross-county bilateral or multi-lateral collaborative research grants. The key activities under this theme are: conducting baseline studies to identify capacity strengthening needs of participating Councils in designing cooperation agreements; Coaching and mentoring of Councils on designing and managing cooperation agreements; issuing competitive cooperation grant call for proposals in consultation with Councils; Co-funding cooperation research projects with participating Councils which have entered into cooperation agreements with each other; Monitoring funded projects and synthesizing lessons in consultation with the Councils: Providing training for SGCs on STI policy processes (theory and practices). The key outcomes were better scientific collaboration between participating SGCs; Enhanced ability of participating SGCs to foster cross-country research collaborations between African higher education and research institutions; Improved capacity of participating SGCs in managing cross-country research and scientific collaborations and managing collaborative research grants; A more interactive and linked up knowledge and experience sharing platforms between the participating Councils. A number of key observations lessons and outcomes were recorded so far by the project namely: Collaborative projects have at times made use of grant management systems that are already in place in a country. Holding frequent physical meetings and active communication with grant winners and other stakeholders right from outset was useful for efficient cross-country research collaboration. It was observed that a delay in some of the partnerships due to language issues was evident, perceived lack of grant ownership by some of the SGCs, and differences in the level of SGC autonomy to make decisions.

Other key lessons outlined were: It is easier for many SGCs to provide co-financing that is in-kind in nature than cash contributions to research projects funded by donors, SGCs would benefit from support and guidance in a range of areas beyond the main themes of the SGCI notably, general M&E and digitalization support. Other lessons learnt include: even small cross-country collaborative grants can produce tangible 'commercializable' results, language and cultural/institutional barriers between Francophone, Lusophone and Anglophone organizations need more systemic collaboration for it to work effectively.

Scinnovent Centre

Dr. Bolo from the Scinnovent Centre made a presentation on the activities undertaken under theme Three of the SGCI. The first one was the public-private partnership projects in ten countries. For example in Cote d'voire, optimization of rice production in the Nanan perimeter (Yamoussoukro-Côte d'Ivoire), the development of electrolytic technologies for decontamination of domestic and industrial aqueous effluents were some of the projects undertaken. He went on to add that in Uganda,the commercial exploitation of propolis and bee venom in Uganda, cocoa waste to wealth using yeast strains from Ugandan box fermentation, a high fibre bakery and confectionery products from maize germ and bran were some of the projects initiated in that country. He said that similarly in Malawi, a number of projects were undertaken namely: Biogas as a social entreprise at Tsangao vegetable market in Ntcheu district, solar powered technologies for smallholder dairy industry and biogass gassification for decentralised electricity generation.

Dr.Bolo submitted that regional studies on health industry nexus were undertaken.The first study was done under the auspices of the East African Community on local pharmaceutical and manufacturing and access to essential medicines. He went on to add that the second study was on the Southern African Development Community (SADC) on health financing and social inclusion that involves 5

countries. The third study was under the Economic Community of Western Africa States (ECOWAS) involving eight countries on intellectual property and technology transfer.

He further submitted that the knowledge products produced were two publications namely: communicating with the private sector and empowering Africa through innovative partnerships. He further added that under the sub-theme of stories of change, 8 videos had been produced to demonstrate the stories of change. Lastly, under the intellectual rights Dr. Bolo submitted that two workshops in two countries were undertaken, two themes were also developed and more than sixty people had been trained on intellectual property rights.

Session 2: SGCI-1 Synthesis and roles of councils in monitoring, evaluation and learning (MEL) Donelly Mwachi, SGCI MEL Consultant

Donelly Mwachi, a MEL consultant made a presentation on "the synthesis and roles of councils in monitoring and evaluation". In his report, he pointed out that the MEL approach used was acquire, adapt and apply. A number of acivities took place. The first activity under focus was strengthening ability to manage research. Under this particular activity were several outputs namely: customised regional training courses in STI policy analysis and priority setting, grant-making systems and procedures, on site coaching and on-going access to expert advice. The second activity was to strengthen ability to design and monitor research based on robust STI indicators.The outputs under these were: customised trainings/courses/workshops/seminars, on-site coaching etc. He submitted that another activity was to strengthen ability to support knowledge exchange with the private sector. Under this activity, the outputs were: research evidence enabled alignment of research demand, identifying research priority areas with selected areas. He went on to add that another activity was strengthening the ability to establish partnerships with other science system actors. The outputs under this activity were: signing collaborative agreements with demand-led joint activities. All these activities had outputs geared towards more effective research investments and strengthened research leadership for development the participating countries.

Donelly noted that under theme 1(Strengthening the research management capacity of Africa"s science granting councils, being managed by SARIMA and AAU, countries like Mozambique, Namibia and Uganda had developed a good practice guideline. He also added that Kenya had aligned its calls with the big four agenda. Under theme two (Strengthening Africa's science granting councils as champions of indicators in public policy making, eight councils had already modified their data collection instruments (tools). He further added that Rwanda, Kenya and Tanzania had already used the modified instrument to conduct surveys.

He further said that under theme three, (Strengthening partnerships among Africa's science granting councils and the private sector), cooperative agreements have been signed between Uganda and Cote d'Ivoire (March 2018), Senegal and Burkina Faso (March 2018), Malawi and Zimbabwe (Nov 2017). Knowledge output/products produced were: Public-private partnerships in research and innovation: opportunities and barriers for African science granting councils. Some of the emerging points from the councils was that their needed to be trust between the private and the public sectors. Also, private institutions found it hard to co-fund research with public institutions (Kenya). Another finding was that due to the EAC cooperation, different laws from different countries slowed down progress. He also mentioned that there was need to build the capacity of research institutions on resource management (Kenya).

Under theme four, he submitted that nine communication events had been held up to date. They include, regional meetings in Ghana and Ethiopia in 2018 and 2019 respectively, Annual Forums in Tanzania and Cote Idvoire in 2018 and 2019 respectively.

His second part of his presentation was on the roles of science granting councils in monitoring, evaluation and learning (MEL). This was covered under three aspects namely: results documentation,

reflection and learning and re-strategizing. He mentioned that under the aspect on reflection and learning, it is critical to use the evidence emerging from the initiative to plan so that its impact is maximised and also so that it becomes easier to **f**oster cross-country learning beyond Annual Forums and Annual Regional Meetings as this enhances real time learning. He added that under the aspect of restrategising, it's inherent to plan and make decisions using evidence. Lastly, he presented on the MEL infrastructure. He submitted that on top of the tier, we have SGCI I, the SGCI theory of change and the SGCI M &E framework. Under tier two, he mentioned that there is SGCI II, SGCI ToC and Country Nested ToC, SGCI M& E framework and Country Nested M& E framework.

<table>
<tr><td>**Discussions**
Facilitator: Loise Ochanda, IDRC, Kenya</td></tr>
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Some issues were raised and addressed as follows:

Issue 1: "is it better to conduct research through institutions or through indivuduals"? "Do we conduct research by funding individuals or institutions"? In response Ms. Dorothy Ngila from the NRF, South Africa informed that engagement with institutions are usually better guaranteed with high quality knowledge products than with individuals.

Issue 2: How can the SGCs play a role in documenting their own results? The M&E Consultant responded by informing that it is vital for every council to take up its own initiative in terms of documenting its own results. He also added that every country ought to have its own country-specific M&E framework. He further added that self-assesment was the most prudent as it helps the councils to make effective decisions.

Issue 3: Could there be differentiated interventions for the SGCs considering that they are all at different stages of development? In response, Loise Ochanda of IDRC informed that the concern had been noticed and a proper response would be given based on the feedback collected from the Councils. Loise also added that all resources/outputs from the SGCI are readily available on the website www.sgciafrica.org .She also called on greater and enhanced coordination amongst the CTAs.

<table>
<tr><td>**Session 3: Fish bowl: Looking forward by SGCs**
Facilitator: Dorothy Ngila, National Research Foundation, South Africa</td></tr>
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This session was mostly on reflections, perspectives, collaborations and partnerships. It was a session to reflect on what has been achieved and the way forward. A panel of select members were selected to share their perspectives on the thematic area under discussion. A short video on the plenary was played for the audience. What followed was a brief session on the reactions to that video. The first reaction by a panel member was that partnerships and collaborations have gotten stronger. Common standards have been developed for monitoring and evaluation. He went on to give an example of Mozambique and Zambia where partnerships and collaborations have led to joint programmes. The second panel member opined that there was power in collaborations. She went on to add that collaborations between the partners had been a success. She added that partners who had been reluctant to join the SCGI had now agreed to come on board. Another panel member stated that it was vital to make time for vertical and horizontal partnerships and that collaborations between the CTAs needed to be enhanced. He further added that there was need for collaborations and partnerships between the private sector research institutions and the Government. Where these partnerships existed it was easier to get funds for research.

<table>
<tr><td>**Political economy studies : Findings and implications for the SGCI**
Chux Daniels, University of Sussex, United Kingdom</td></tr>
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Dr.Chux Daniels and Dr.Rob Byrne made a presentation on "Updating the Case Studies of the Political Economy of Science Granting Councils in SSA". The main focus was on Political Economy (PE) Phase 1 and 2 Dr. Chux added that the study objectives were to: advance existing knowledge on the political and economic context of SGCs in selected countries/regions, including the role and influence of key institutions, agents and structures through an understanding of this political and economic context,

identify key considerations (e.g., opportunities, barriers, strengths) that can inform SGCI objectives and provide baseline information to inform the overall evaluation of the SGCI, including recommendations for ongoing monitoring or ex post assessment to gauge the impact of SGCI activities.

Dr.Chux submitted that the main findings of the study were as follows:

- All case study countries committed to increased funding for science;
- There were increased roles for the SGCs at the national and regional levels as a granting council
- There is reference on the important role that the private sector could play. However, private sector funding is low and engagement is patchy.
- There is increasing activity at the regional level and that there were divergent agendas at national and regional levels.
- There was no clear narrative about strengths in East, West and Southern Africa.
- Health and agriculture were the sectors which received the most resource in the SSA region but this may change over the coming years.

Dr. Chux further noted that PE 1 had a number of outputs namely:

- Full report: Case Studies of the Political Economy of Science Granting Councils in Sub-Saharan Africa,
- Journal paper 1: Science Granting Councils in Sub-Saharan Africa: trends and tensions (Jo Chataway et al. https://doi.org/10.1093/scipol/scz007),
- Journal paper 2: SGCs as Boundary Organisations (led by Becky Hanlin, forthcoming)
- Policy brief: How do political economy factors influence the evolution of science funding in sub-Saharan Africa?
- Book chapter: The Republic of Science meets the Republics of Somewhere: Embedding scientific excellence in SSA (Jo Chataway and Chux Daniels) among others.

Under PE 2, Dr.Chux added that the study objectives were to investigate the ways in which the PE of SGCs has changed since the first study (i.e. PE1, "baseline"), to capture the specific changes (where available) on how evidence and support has informed research allocation and grants management in SGCs, to examine how SGCI learning outputs have been taken up by SGCs and research leaders. The main findings of the PE 2 were sub-divided into several themes including: Governance and development strategies, human resources, public and private sector funding, research excellence, and innovation systems. Under theme I, the findings were that STI is cross-cutting and so needs to be considered by all ministries. Another finding was that economic development is mainly occurring in the informal sector and in the service industries and that there was need to focus on development problems and the type of industrialisation that is promoted. Under theme two (human resources), the finding was that university access and quality were the main constraints and that there was a mismatch of skills.

Under theme three, it was observed that funding remains a big challenge and that most governments were not keen on funding science. Under theme four (research excellence) Dr. Chux noted that lack of STI infrastructure and a weak research culture among researchers was to blame. He added that lack of opportunities for junior researchers/post docs, low pay with no incentives was also another challenge. On the last theme (innovation systems), Dr. Chux added that he found out that their existed a weak innovation support system and that there was low technology transfer. He noted that the implication of the political economy analysis were that there seemed to be a very specific concept of innovation dominating the discourse. Another implication was that support for science may be focussed on a narrow set of activities or interventions that are inherently uncertain or even risky.

He went on to submit that a number of outputs were expected: Full report on updating the Case Studies of the Political Economy of Science Granting Councils in Sub-Saharan Africa, five National Case

Studies, Journal paper, policy brief, book chapter, and blogs. These were critical in advancing the pool of resources for the study.

Dr.Chux also made a presentation on the "Prospects for Transformative Innovation Policy in Africa" where he outlioned the three frames of innovation policy. He said that under frame 1, the policy activities undertaken are R&D stimulation (subsidies, tax credits, procurement, mission-oriented programs), intellectual Property Rights, improved knowledge base, and education Policy on Science and Engineering among others. He further added that under frame two (national systems for innovation), a number of activities were involved for example technology platforms, use of demand stimuli, e.g. procurement, building Regional & National System of Innovation among others. He further added that under the last frame, (transformative change: Policy Activities), the activities undertaken were: New institutions for coordination between various policies, integrating STI into other policies (energy, housing, agriculture, healthcare, transport, and city policies); seeking policy mixes, technology forcing, through regulation and/or procurement and building on social innovation, among others. He went on to mention that some of the insights gained from the country case studies were: evidence of a sense of urgency, STI is under pressure to deliver not only economic development but also contribute to societal and environmental goals, question about relationships between Frames need to be addressed, frames 1 & 2 not sufficiently delivering development objectives (impact), top-down approaches to STI policymaking continue to dominate.

Dr.Chux concluded that most significant change in the PE of SGCs is a shifting discourse on research excellence. He admitted that there were risks in this related to the understanding of both innovation and the science-to-innovation relationship. Also, there was need for new narratives, supported by evidence based on appropriate (new) indicators. He finalized by adding that case studies showed that there was a great need for a new framework and theory of change under the transformative innovation policy. Finally, he pointed out that there was a huge realization that African development visions will need transformative approaches such as policy experimentation.

SGCI capacity building effectiveness case studies: Rationale, methods, and preliminary findings
Julius Mugwagwa, University College London, United Kingdom

Dr. Julius Mugwagwa made a presentation on SGCI Training Effectiveness Case Studies (STECS) Project. He informed that the premise of the study was three fold: STECS aims to understand uptake and use of training, knowledge products and technical support in a deeper way, STECS will integrate an overarching view on gender, inclusivity and inter-sectionality and that STECS provides a key, early point for documenting SGC engagement with SGCI and hopes to form part of a structured process moving forward.He further added that the main research question in the whole study was "how Science Granting Councils Initiative (SGCI) trainings and other forms of technical support influence the performance of beneficiary Science Granting Councils (SGCs).

He noted that the STECS project had undergone various steps/processes. These were, evaluation analysis and collation of data. He said that the three evaluation questions that were asked were: how have evidence, knowledge exchange and support informed research allocation and grants management by SGCs?, how have learning outputs been taken up by the SGCs?, and what adjustments need to be made in SGCI processes for increased effectiveness of SGCs. A number of primary cases were undertaken. He said that in Burkina Faso, the finding was that in terms of research allocation and grant management, they were trained to undertake standard research competitions. In terms of the uptake of learning outcomes, training had been received from NEPAD, the STI survey tool had been modified and partnership projects under theme 3 had been modified.

Under the primary case in Kenya, in terms of research allocation and grant management, the finding was that the 'Good Practice Guideline' was used to conduct quality research, research competitions

were launched, as a result of trainings conducted by SARIMA. He added that in terms of the uptake of learning outcomes, the finding was that there was no evidence yet of uptake of learning outcomes. He submitted that in another case study (Malawi), Scinnovent had trained and developed a call for proposals for PPPs while the finding in terms of uptake of learning outcomes was that there was development of calls based on the training by Scinnovent. Other primary cases were undertaken in Mozambique, Namibia, Rwanda, Uganda and Zambia.

Dr. Mugwagwa, further noted that a number of outputs and outcomes were proposed. In terms of project reports, the output/outcome was summarising method, approach and case study findings. In terms of Policy briefs, to-summarise key practical considerations from case studies. He added that in terms of Journal articles, the expected outcome was an article "Unpacking the influence of cross-country networking in strengthening national science ecosystems: a case study of the African Science Granting Councils Initiative" (Research Policy), "Evolving networks and arenas of influence for national science councils in Africa" (Science and Public Policy) .

Dr. Mugwagwa concluded that the next steps in the study is the process of getting research permits (STECS Team needs SGC support), collecting primary data (in progress) and data analysis, interpretation and reporting. He closed the session by enumerating the preliminary findings on secondary case studies in a number of countries. For example in Botswana, the finding was that the tools of STI data collection management had not yet been used. Another finding was that the PPP programme was still under development. He went on to add that in Cote d"Ivoire, the status of the (basis of non-selection as primary case) was that the data collection tools had been modified but surveys had not yet been concluded. He added that another finding was that there was no calls for research competitions, no evidence for PPP.

| **Closing remarks** |
| **Ellie Osir, IDRC, Kenya** |

Ellie Osir closed the session by underscoring the key lessons learnt from the session. He said that one of the most critical lessons learnt was that African Science Granting Councils are already working collaboratively in bilateral and multi-lateral cooperation, sharing resources, infrastructures, skills and capacities. These collaborations promote openness and in some cases have led to peer – to – peer learning, experience and knowledge sharing and replicability. He also noted that a number of M &E processes had worked for the SGCI. He also added that the transition to a "knowledge society" in which productivity and innovation would be hinged more on knowledge – its generation and application – and less on natural resource endowments is critical to sustainable development. He implored on the delegates to lobby for more resource allocations towards science, as this was the surest way of accelerating development in Africa.

APPENDIX 3 : SELECTED KNOWLEDGE OUTPUTS
1.   Link to a Set of Knowledge Outputs from the Commissioned Research