# Incorporating Elements of Research Excellence into Councils' Research and Innovation Management Systems and Practices

## Synthesis Report

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# Executive Summary

Since January 2023, the African Centre for Technology Studies (ACTS), in collaboration with the Association of African Universities (AAU), and University of Cheikh Anta Diop de Dakar (UCAD) Senegal, has been implementing a project on **Supporting Science Granting Councils to fund and manage research and innovation Projects.** The goal of the project is to strengthen the capacity of Science Granting Councils (SGCs) to fund and manage research and innovation projects in areas aligned with their national development plans and priorities. The primary goal is to support the councils in carrying out key activities, including refining, adapting, and applying research and innovation frameworks; designing and managing high-quality research competitions; integrating gender equality, inclusivity, and ethical considerations; conducting monitoring, evaluation, and learning activities for funded projects; and synthesizing research outputs into relevant knowledge products.

The Research Excellence Report was developed based on an analysis of documents provided by the SGCs: concept notes, collaboration agreements, research proposals of the projects selected for funding. The main objective of this synthesis report is to analyze and document how the different councils have integrated elements of research excellence into their research and innovation management systems and practices. It details the targets, strategies, and the achievements made by councils in relation to research excellence. The report is also structured to identify success stories, share lessons among councils, and identify best practices in relation to research excellence.

The synthesis report shows that the SGCs have made deliberate efforts to incorporate elements of research excellence into their research and innovation management systems and practices. The councils have made deliberate efforts to design high-quality research calls that prioritize policy relevance, innovation, collaboration, gender and inclusivity, as well as multidisciplinary approaches. Our analysis also shows that councils have demonstrated research excellence through Research Quality Plus (RQ+) which includes several aspects and dimensions: originality and relevance, accessibility of research data, actionability and scalability, scientific rigour, research legitimacy and research importance.

In summary, the SGCs have performed excellently in incorporating elements of research excellence into their research and innovation management systems and practices. This may be attributed to the emphasis of the Research and Innovation Management (RIM) project, as well as the training provided by AAU on research excellence during SGCI II.

# Acknowledgments

# Abbreviations

| | |
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| **AAU** | Association of African Universities |
| **ACTS** | African Centre for Technology Studies |
| **Co-PI** | Co-Principal Investigator |
| **COSTECH** | Tanzanian Commission for Science and Technology |
| **ECA** | Early Career Academic |
| **FONSTI** | Fonds pour la Science, la Technologie et l'innovation (Science Technology and Innovation Fund) |
| **GEI** | Gender, Equality, and Inclusion |
| **IDRC** | International Development Research Centre |
| **MESRI** | Ministère de l'Enseignement Supérieur, de la Recherche et de l'Innovation. (The Ministry of Higher Education Research and Innovation) |
| **MESTI** | Ministry of Environment, Science, Technology, and Innovation of Ghana |
| **MSc** | Master of Science |
| **MSME** | Micro, Small and Medium-sized Enterprises |
| **NCST Rwanda** | National Councils for Science and Technology of Rwanda |
| **NRF** **UNCST** | National Research Fund, Kenya Uganda National Commission for Science and Technology |
| **PhD** | Philosophical Doctorate/ Doctor of Philosophy |
| **PI** | Principal Investigator |
| **RGC-MInT** | Research Granting Council – Ministry of Information and Technology of Ethiopia |
| **RIM** | Research and Innovation Management [Project] |
| **SDG** | Sustainable Development Goals |
| **SGC** | Science Granting Council |
| **SGCI** | Science Granting Councils Initiative |
| **SME** | Small and Medium-sized Enterprises |
| **SSA** | Sub-Saharan Africa |
| **STEM** | Science Technology Engineering and Mathematics |
| **STI** | Science, Technology, and Innovation |
| **UCAD** | University of Cheikh Anta Diop de Dakar |
| **UK FCDO** | United Kingdom Foreign, Commonwealth and Development Office |

# 1. Introduction

## 1.1 Background of the Synthesis Report

Since January 2023, the African Centre for Technology Studies (ACTS), in collaboration with the Association of African Universities (AAU), and University of Cheikh Anta Diop de Dakar (UCAD) Senegal, has been implementing a project on **Supporting Science Granting Councils to fund and manage research and innovation.** The goal of the project is to strengthen the capacity of Science Granting Councils (SGCs) to fund and manage research and innovation in areas aligned with their national development plans and priorities. To realize this goal, the consortium is supporting the councils to undertake the following key activities:

1. Refine, adapt, and use research,and innovation frameworks.
2. Design and manage high-quality research competitions.
3. Mainstream gender equality, inclusivity, and ethical considerations in all the funded projects.
4. Conduct monitoring, evaluation and learning activities of the funded projects.
5. Synthesize research outputs and develop relevant knowledge products.

The implementation of these activities will enhance the councils' ability to support research projects that contribute to economic and social development in their countries. This will result in more effective national STI systems which contribute to inclusive development in sub-Saharan Africa.

This synthesis report focuses on how the SGCs have incorporated elements of research excellence into their research and innovation management systems and practices during the project implementation. Research excellence, both as a concept and practice, has been on the discussion front at the Science Granting Councils Initiative (SGCI). To embed it in practice, as one way of enhancing science technology and innovation in Africa, the SGCI has provided dimensions and pillars critical for achieving research excellence. Across councils, there are some key research excellence dimensions that have stood out as critical, and these follow closely the recommendations of IDRC. The two main pillars of research excellence are high-quality research calls/ competitions and Research Quality Plus (RQ+). These two pillars, and how SGCs applied them, are elaborated in subsequent sections.

Research excellence considers not only how research advances knowledge, but also how it shapes society, benefits specific communities, and is applied by diverse groups. It should be defined as much by meaningful outcomes as by the quality of the research process. Research excellence in outcomes typically looks at the number of peer-reviewed research publications and metrics; excellence in processes considers how the research was inclusive of all groups, encouraged diverse values and perspectives, and ensured women's involvement throughout the research process.

## 1.2    Rationale for the Synthesis

To strengthen research and innovation (R&I) management systems and practices within the SGCs, it is essential to integrate elements of research excellence. In this regard, the RIM project and the SGCI's combined theory of change set out specific targets to be achieved by October 2025, marking the conclusion of the RIM project's implementation.

i. Improved understanding of research excellence and emerging scientific practices by the SGCs.
ii. Document numbers of SGCs trained on research excellence and emerging scientific practices.
iii. Document numbers and examples of SGCs that incorporate elements of research excellence into their research and innovation management systems and practices.

Based on these targets, there is a need to assess and document the extent to which the SGCs have incorporated the elements of research excellence in their research and innovation systems and practices.

## 1.3    Goal and Objectives

The overall goal of this synthesis is to document the extent to which SGCs have incorporated elements of research excellence into their research and innovation management systems and practices. The specific objectives are:

i. Document numbers of SGCs trained on research excellence and emerging scientific practices.
ii. Document numbers and examples of SGCs that incorporate elements of research excellence into their research and innovation management systems and practices.
iii. To identify success stories, challenges, and perceptions in the councils' commitment to incorporate the elements of research excellence in their research and innovation systems and practices.
iv. To prepare and disseminate the findings and recommendations.

## 1.4    Methodology

This synthesis work involved a desk review of the following existing documents: concept notes submitted to ACTS by the seventeen (17) councils, collaborative agreements signed by the seventeen councils, the calls/competitions designed by the councils, and ACTS and the proposals for the 83 projects competitively selected by councils for funding. Online data collected from the councils augmented the desk review.

# 2. Findings

## 2.1    Research Excellence Considerations

Research excellence, both as a concept and practice, has been on the discussion front at the SGCI. To embed it in practice, as one way of enhancing science technology and innovation in Africa, the SGCI has provided dimensions and pillars critical for achieving research excellence. Across councils, there are some key research excellence dimensions that have stood out as critical, and these follow closely the recommendations of IDRC.

There are two (2) key pillars of research excellence:

    **a.**   High-quality research calls/ competitions
    **b.**   Research Quality Plus (RQ+).

Research Quality Plus (RQ+) encompasses several dimensions, including originality and relevance, accessibility of research data, actionability and scalability, scientific rigour, problem –solution orientation, and alignment with national development agendas. Additional dimensions cover policy relevance, gender equity and inclusivity, collaboration, innovation, multi- and interdisciplinarity, research ethics as well as the use of digital grants management systems, databases of peer reviewers and strategies for monitoring, evaluation, and learning.

Generally, it is observed that different councils focused differently on the multiple dimensions within each pillar.

### 2.1.1  High-quality research calls/ competitions

As mentioned earlier, high-quality-research calls/competitions are a key dimension of research excellence proposed for SGCs. Within the high-quality research call/ competitions pillar, there are eleven (11) elements that have to be considered while designing high-quality research calls.  This analysis of the documents shared by the SGCs noted some key issues as outlined below:

**Problem/solutions focus:**  At least 4 councils (24% of the councils) emphasized on the need of solutions-oriented research projects or impact-focused projects in their call for research proposals.

Examples of councils that have emphasized solution-oriented or impact-focused projects in their call for proposals:

    **a.**   The National Commission for Science and Technology (NCST) in Malawi emphasized on solutions-oriented research projects in their call.
    **b.**   Uganda National Council for Science and Technology (UNCST) required project applicants to communicate the expected impact of their projects. There was need to illustrate clear rooting of the proposal in the demands of the private sector (industry) partners and/or stakeholders, including appropriate integration of gender and quality and feasibility of the research impact indicators.  An example of this project is the 'Up-scaling the uptake of cocoa innovative technologies for enhanced value addition during primary processing.'
    **c.**   Namibia's National Commission on Research, Science and Technology (NCRST) expected all project applicants to demonstrate potential impact on the end-use (market needs), as well as addressing contemporary challenges, with clear deliverables.
    **d.**   The Ministry of Environment, Science, Technology and Innovation (MESTI) in Ghana required all project applicants to demonstrate local and global relevance of their proposals.

**Link between national development agenda:** Analysis shows that a total of three (3) councils (17% of the councils) required the applicants to illustrate how their projects link to the national development agenda.

Examples of councils that have emphasized the need of the projects to illustrate the link between the projects and the national development agenda:

a. NCST Malawi designed its research calls in line with Malawi's newly developed National Research Agenda (NRA) to link research projects with the national agenda.

b. The National Research Fund (NRF) Kenya ensured that its call targets projects that address national priority areas. The projects selected for funding fit well within the national priority areas:

   i. Health (mental health awareness) – 'A digital intervention for the prevention and early detection of depression and suicide among the youth in Kenya.'

   ii. Industrial development (leather value chains) – 'Capacity Building for the Job Creation and Growth of the Leather Goods and Leather Footwear Manufacturing Enterprises in Kenya.'

c. UNCST Uganda required project applicants to demonstrate clear impact on national development challenges, including youth unemployment, industrialization, human capital development etc. For instance, the '*Maize germ and Bran as raw materials for high fibre value added bakery and confectionery products/ Up-scaling and commercialization of maize bran and germ value added products in Uganda.*' That seeks to address unemployment as a national development agenda.

## Policy Relevance

on policy relevance, at least six (6) councils (35% of the councils) called for policy relevant research projects.

Some of the councils that called for policy relevant research projects include:

a. In its calls, NCST Malawi emphasized the need for policy-relevant research aligned with the National Science and Technology Policy of 2002, particularly in areas such as ICT, agriculture, innovation, and human capacity development.

b. NRF Kenya required project proposals to demonstrate relevance of proposed research as well as its feasibility and potential impact. A good example is the project on '*Commercialization of Cassava for Improved Food and Nutritional Security in Western Kenya (CCIFNS)*' project that was selected for funding and is being implemented by researchers at Masinde Muliro University of Science and Technology (MMUST).

c. Botswana Digital & Innovation Hub (BDH) requires project proposals to demonstrate policy relevance and to outline the beneficiaries and target audience. An example of the project selected for funding is the 'Bioconversion of waste to energy as a means to advance circular bioeconomy in Botswana: A sustainable strategy for meeting energy needs'.

d. On policy relevance, NCRST Namibia  provides elaborate guidelines to ensure project applicants demonstrate the potential for industrial development,

e. MESTI Ghana requires project applicants to design research projects with broader social impact, demand-driven, industry-relevant, and policy-relevant with potential socioeconomic benefits.

## Collaborative initiatives

At least 11 councils (65% of the councils) required that project applicants demonstrate collaborations and partnerships with other stakeholders in the STI system - academia, industry and private sector.

a. Collaborative research projects are clearly demonstrated  in the trilateral and bilateral calls outlined below:

   i. A trilateral call was issued between NCST Malawi, NSTC Zambia, and the Research Council of Zimbabwe (RCZ).

   ii. A bilateral call was issued between FNI Mozambique and BDIH Botswana.

   iii. A bilateral call was issued between FONSTI Côte d'Ivoire and FNI Mozambique.

   iv. A bilateral call issued between MESTI Ghana and NSTC Zambia.

**b.** NCST Rwanda required project applicants to demonstrate partnerships and collaborations with academia, industry, private sector as well as regional and global partnerships (to be measured using MOUs and measurable agreements). For instance, the project on the '*Development of Modern Biological Control Solutions for Sustainable Management of Destructive Invasive Insect Pests of Maize and Tomato for Better Food Security, Safety and Nutrition in Rwanda demonstrated collaboration with different partners*'.

**c.** NRF Kenya achieved collaborations through calls which specified and required academic, private sector, and industry collaborations. For instance, NRF required project teams to be collaborations between industry and Technical and Vocational Education and Training (TVET) actors. In the project*, 'Capacity building for the job creation and growth of the leather goods and leather footwear manufacturing enterprises in Kenya'*, the research team is composed of a university, a voluntary technical college and a private sector actor.

**d.** UNCST Uganda has a requirement for 'Quality and efficiency of the implementation' – Complementarity, range, and level of integration of the Academia-Industry research team, appropriate for implementing the proposed research project. This also includes an explanation of how industry engagement in the project will contribute to the exploitation and deployment of results. The project on '*Up-scaling the uptake of cocoa innovative technologies for enhanced value addition during primary processing*' brings together four (4) different private sector companies, alongside researchers from Makerere University.

**e.** NCRST Namibia requires - beyond collaboration – a clear demonstration of the added value and capacity to be expected from any collaborations.

**f.** MESTI Ghana emphasizes on collaborative research (academy-industry collaborations), broader stakeholder engagement & involvement across research lifecycle.

## Innovativeness

At least seven (7) councils (41% of the councils), in their calls for proposals, required project applicants to illustrate the innovativeness of the projects. This included different aspects such as novel technology employed, innovative research ideas and commercial viability of the projects.

**a.** Tanzania Commission for Science and Technology (COSTECH) required project applicants to clearly indicate a novel technology to be developed or improved during or through their research project. COSTECH's call emphasized, as its main theme, the 'Up-scaling of research results in food security for sustainable development.'

**b.** NCST Malawi called for innovative research projects to promote highly innovative research ideas capable of producing commercially viable research outputs.

**c.** NCST Rwanda called for projects that ensure technology development and transfer, clearly specifying who the beneficiaries and strategies for technology transfer. The project on 'Development of Multi-Grain Seeding Machine' has clearly outlined smallholder farmers as its key beneficiary group, and intends to design and manufacture an engine power tiller, a special two-wheeled agricultural machine fitted with rotary tiller; it provides a smooth resistance to all farm activities like - tillage, irrigation, seeding, harvest and transportation.

**d.** NRF Kenya championed innovation by focusing on research projects that clearly demonstrate novelty as well as commercial viability of research outputs as well as projects that address resultant IP regimes. The project on 'Digital intervention for the prevention and early detection of depression and suicide among the youth in Kenya' has demonstrated the potential for an innovative prototype mental app.

**e.** UNCST Uganda requires 'Scientific excellence' of research projects from applicants. In this case, applicants are required to demonstrate strong potential to generate new knowledge, insights and/or innovations; disciplinary and/or interdisciplinary value add; and sufficient complementarity to other research programs. The maize and bran germ project implemented at Makerere University seeks to achieve 'process optimization for maize bran and germ value added products through incorporation of other flours (millet and soya) for enhancement of sensory properties of the products.'

f.   BDIH Botswana recommends that project applicants elaborate on intellectual property issues and how these will be addressed in the project.

g.   NCRST Namibia requires projects to demonstrate technology capability (show whether the prototype, or proof of concept that is illustrated and has been proven to work). Projects are also required to demonstrate scientific quality and innovativeness of the research proposals, as well as IP regimes and concerns.

## Multi- and interdisciplinarity

Our analysis shows that two (2) councils (12% of the councils) emphasized on multidisciplinary and interdisciplinary research projects, while advocating for diversity in perspectives and expertise.

a.   NCST Malawi emphasized multidisciplinary and interdisciplinary research projects that bring diverse perspectives and expertise; and support the (likelihood, and) development of new and innovative solutions.

b.   BDIH Botswana advocates for multidisciplinary and collaborative approach among researchers and institutions (diversity in expertise among researchers as well as collaboration with academia, private sector and industry actors) as well as public-private partnerships.

## Gender Equity and Inclusivity

At least 12 SGCs have projects dedicated to women, are women-led (female PIs) or are ring-fenced for women researchers. Refer a synthesis report on gender and inclusivity for a detailed review. Some of the key emerging issues are highlighted below:

a.   Councils set out to ensure gender and inclusivity is reflected in the projects they select for funding. The gender and inclusivity aspect has appeared in different dimensions:

   i.   Ringfencing specific projects for women researchers (i.e., NRF Kenya, FONSTI Cote d'Ivoire, COSTECH, Ghana and NSTC Zambia).

   ii.   Setting up a minimum quota for women-led research projects (i.e., Cote d'Ivoire, Malawi, Tanzania, Ghana, Uganda, Mozambique, and Zambia).

   iii.   Encouraging women PIs to apply (NRF Kenya, COSTECH, NCST Malawi, NSTC Zambia and FONSTI Cote d'Ivoire).

   iv.   Giving gender aspects a significant weight in terms of project proposal evaluations (UNCST, NCRST); ensuring gender representation in proposal evaluation teams (NCRST).

   v.   Ensuring research teams are gender inclusive in terms of composition (UNCST, NCST Malawi, MESTI Ghana, MESRI Senegal).

   vi.   Ensuring women are given serious roles within research teams (apart from just being part of a team to fulfill gender inclusive requirements.

b.   In addition to the aforementioned dimensions, there are projects designed to address gendered themes, and the integration of gender inclusion as part of the research and innovation frameworks of councils. Our analysis shows that (71%) of the councils (12 SGCs)  (Botswana, Tanzania, Mozambique, Kenya, Ethiopia, Senegal, Sierra Leone, Ghana, Zambia, Rwanda, and Cote d'Ivoire) have funded projects dedicated to women, are women-led (female PIs) or ring-fenced for women researchers.

c.   On inclusivity, councils set to enhance inclusion of students and early career researchers (ECRs), as well as actors in the informal and private sectors into project applicants' research teams. From the funded projects, NCST Malawi, NCRST Namibia, RCZ Zimbabwe, NSTC Zambia, UNCST Uganda, and NRF Kenya included MSc and PhD students as part of research teams. NCST Malawi and NRF Kenya have listed informal sector actors and informal sector innovations in the selected projects for funding.

d.   COSTECH Tanzania captured the inclusivity dimension in two ways: partly in the form of knowledge sharing – for inclusivity purposes, and gender mainstreaming.

## Research Ethics

At least three councils (3) clearly indicated the guidelines to be considered by the applicants in relation to research ethics.

a. COSTECH Tanzania has in place a National Research Integrity Framework (NRIF) which set standards for ethical conduct in research with intention to maximize the quality and robustness of research and guides the enforcing of responsible conduct of research (in all aspects and at all stages including research idea conception, proposal development, data analysis and drawing conclusions and ultimately reporting and/or publication of the findings). The framework (NRIF) emphasizes supporting a research environment that is underpinned by a culture of based on good governance, best practices, and transparency. All supported research projects and processes have been guided by this framework.

b. NCST Malawi provided elaborate requirements for all research teams to obtain clearance from relevant institutions as a primary way of ensuring research ethics.

c. NCST Rwanda demonstrated commitment to research ethics by requiring all project applicants to demonstrate ethical and social considerations within their research projects.

## Use of Online Grants Management Systems (OGMS)

The use of the Online Grants Management Systems (OGMS) in the management of the research calls and the other grants processes, was employed by at least six (6) councils (35%). These councils comprise of NCRST Namibia, NSTC Zambia, RCZ Zimbabwe, UNCST Uganda, NCST Malawi and Sierra Leone (through AAU's support).

Notably, NCRST Namibia was supported through SGCI-2 to put in place a digital grant management system, which had not been operationalized due to lack of research funds. They opted to implement national research and innovation projects specifically to pilot the system in preparation for the IDRC/ NORAD and other government research funding stream.

## Database of Peer Reviewers

Some councils outlined aspects on the database of peer reviewers to their research applicants. Of the 17 councils, at least three (3) councils (Senegal, Malawi and Uganda), emphasized employment of existing expert reviewers for project proposals.

a. MESRI Senegal: Verification of proposals on their conformity to the call requirements is the first step to ensuring research excellence. Subsequently, the project proposals are submitted to a scientific committee of leading experts, who evaluate them and provide recommendations on the most deserving projects for funding.

b. NCST Malawi encouraged the use of existing reviewers for their research call.

c. UNCST Uganda endeavored to ensure experts review outcomes of the researchers' project proposals.

## Monitoring, Evaluation and Learning (MEL) Strategies

Councils indicated that the projects selected for funding needed to detail MEL plans, risk management plans and the sustainability matrix. At least six (6) councils (Botswana, Cote d'Ivoire, Malawi, Uganda, Namibia, and Rwanda) applied MEL strategies.

a. FONSTI Cote d'Ivoire has a management manual for calls for projects, and monitoring and evaluation. Since it is a competitive fund, only projects deemed excellent after evaluation benefit from funding.

b. NCST Malawi has put in place a requirement for research projects to develop their MEL plans and indicators which will be monitored during the course of implementation of the project.

c. UNCST Uganda requires project applicants to clearly explain the research team's plan for implementation of the projects throughout the lifespan of a project.

d. BDIH Botswana required project applicants to elaborate on their risk management and preparedness.

e. NCRST Namibia requires projects to demonstrate practicality, realistic, feasibility and consistency of the proposed activities with the objectives of the call.

f. NCST Rwanda requires all selected projects to develop a result-based management framework that focus on tracking results and how the research grant projects feed into the achievement of overall project goals.

### 2.1.2 Research Quality Plus (RQ+)

Within the RQ+ framework, there are four (4) quality dimensions – scientific rigour, research legitimacy, research importance, positioning for use – for which councils and beneficiaries committed to structure their projects to ensure research excellence:

## Scientific Rigour

Scientific Rigour is expressed through research protocols and methodological integrity. In relation to the scientific rigour dimension, at least 7 councils (Malawi, Rwanda, Tanzania, Kenya, Uganda, Botswana, and Namibia) required the project applicants to consider two key aspects: protocol and methodological integrity, which then demonstrated research excellence:

### i. Protocol

i. NCST Malawi required projects, through their applications, to demonstrate research rigor.

ii. NCST Rwanda made specific requirements in the call for research syntheses, which includes development of protocols, methods, techniques, software, devices achieved as part of a research project.

### ii. Methodological integrity

iii. COSTECH Tanzania required applicants to indicate the proposed methods, analytical techniques, and their appropriateness as necessary Applicants were also expected to describe – where applicable – the facilities and equipment to be used, the study type, research design, technology development and innovation as well as the location, intended beneficiaries, sampling frame and methods.

iv. NRF Kenya called for project applicants to demonstrate suitability of the proposed research design and methodology, as well as the technical capacity of the research teams.

v. UNCST Uganda requires that project applicants demonstrate adequacy and feasibility of the research methodology/approach and activities in relation to research questions and objectives as well as the related work plan. Also, on scientific rigour in general, UNCST Uganda requires project applicants to demonstrate the capacity of research teams to implement the proposed project. UNCST was also specific in requiring project applicants to demonstrate adequacy of the research approach including the robustness of the conceptual framework and experimental set-up as well as the coherence of the hypotheses, research questions and methods.

vi. BDIH Botswana's research excellence criteria emphasize strict adherence to principles of transparency, openness, quality, fairness, conflict-of-interest management, and confidentiality regarding individual proposals, applicants, and review outcomes. Applied research is BDIH's methodology of preference (applicants required to demonstrate the application of scientific principles or basic scientific discoveries to solve real life challenges) in listed thematic areas.

vii. NCRST Namibia requires projects to demonstrate clarity and feasibility of the methodology provided as well as competence, expertise and experience of the principal investigators and scientists/ researchers involved.

## Research Legitimacy

Research legitimacy include aspects of addressing potentially negative consequences (Ethics), inclusivity, gender equality and engagement with local knowledge. Most of the councils have considered these issues in their calls for proposals. The aspects on gender and inclusiveness were elaborated on in section (1) of this report.

## Research Importance

This dimension is assessed through the relevance of the funded projects, evaluating the extent to which they contribute to the national development agenda. As demonstrated earlier, all councils have aligned their calls with projects that directly address national priorities. Some councils required the project applicants to demonstrate the aspects of relevance as follows:

1.  UNCST Uganda required project applicants to demonstrate adequacy, feasibility, and coherence of the various activities to enhance impact, in particular, by influencing research results uptake and commercialization. The 3 projects selected for funding address food security as a national agenda and aspires to increase entrepreneurship and job creation in Uganda.

## Positioning for Use

This dimension includes knowledge accessibility and use, research outputs and well as research uptake.

### iii. Knowledge accessibility and sharing

Most of the councils have emphasized the need for knowledge accessibility and sharing. For example:

1.  **COSTECH Tanzania,** through the Directorate of Knowledge Management, assists researchers in the process of identification and locating journals for publications. COSTECH supports researchers by fostering impactful research, advancing knowledge generation, and promoting its effective dissemination. On dissemination of research results, COSTECH also requires applicants to indicate where – and in which form – the results of the work may be disseminated. This must include plans for dissemination to specific end users including policy/decision makers and communities where data and research materials were collected.
2.  **NCST Rwanda** plans to achieve knowledge accessibility and sharing through two main strategies, (1) visibility of research projects especially through social media and institutional websites to share information with all stakeholders, and (2) publications, communications and outreach to reach and include community members.
3.  **UNCST Uganda** required project applicants to show adequate potential for uptake/application of results including quality of the knowledge sharing approach with appropriate stakeholder engagement, capacity development and communication strategies. A good example is the project on *'Piloting the production and distribution of low cost protein and micro-nutrient rich cricket feed from food waste in Kampala'* is one such project that had completed its research work and showed a need for last mile support to facilitate uptake and commercialization.
4.  **BDIH Botswana's** communication and outreach requirements – projects to show how open access will be fostered and media engagements planned, clearly linking the dissemination approach and the intended/ target audience.

### iv. Knowledge Products

**MESTI Ghana** also included in its calls the need for projects to include high-quality knowledge products.

### v. Knowledge uptake and commercialization

1. **COSTECH Tanzania**, through the National Research Integrity Framework, ensures that researchers and their projects utilize the existing supported infrastructure facilities in R&D and higher learning institutions with improved lab facilities to ensure generation of research outputs that can be translated into minimum viable products (MVP) ready for commercialization.
2. **UNCST Uganda** required project applicants to show adequate potential for uptake/application of results including quality of the knowledge sharing approach with appropriate stakeholder engagement, capacity development and communication strategies. The project, 'piloting the production and distribution of low-cost protein and micro-nutrient rich cricket feed from food waste in Kampala' is one such project that had completed its research work and showed a need for last mile support to facilitate uptake and commercialization.
3. In its communications and calls for proposals, NCST Malawi emphasized that research project deliverables must include tangible, commercially viable solutions.
4. **NCRST Namibia** requires projects to demonstrate potential for commercialization of research results.

## 2.1.3 Additional dimensions of research excellence

Beyond the two broad pillars that demonstrate research excellence – high-quality research calls and competitions, and Research Quality Plus (RQ+) – councils have identified additional practices and dimensions of engagement that further strengthen the concept of research excellence. These aspects, which vary by council, reflect the diversity of both aspirations and practices across the research landscape. The following have been observed and noted:

## Capacity Building

a. **COSTECH Tanzania** requires projects to describe how they will build human and institutional capacity as well as required physical infrastructure capacities for R&D and science and technology developments in the country.
b. **NRF Kenya**, through its selected project on mental wellness – a digital intervention for the prevention and early detection of depression and suicide among the youth in Kenya has demonstrated capacity building by including 2 MSc students in the project.
c. **NCST Rwanda** made requirements to applicants to demonstrate capacity building and mentorship plans with a focus on training fellows, junior researchers, and students. All 5 of Rwanda's selected projects have included in their research teams students and interns who will be trained through the project.
d. **NCRST Namibia** requires project applicants to show the projects' plans for capacity building (institutional and/or human).

## Project Sustainability

e. COSTECH Tanzania requires project applicants to clearly outline a sustainability plan that ensures the project continues to operate effectively and deliver its intended benefits to the target group after the grant period ends.
f. NRF Kenya is keen on ensuring that the projects demonstrate sustainability plans.

## Training on RQ+

NCST Malawi committed to implement two capacity building workshops on research excellence to train managers in integrating RQ+ and help NCST develop its own Research Excellence Framework.

## Economy

a. **NRF Kenya** was keen on advancing economic research projects by focusing on research projects demonstrating cost effectiveness and potential for multiplier effects to other economic sectors among previously funded projects.

b. **NCRST Namibia** requires that project councils adhere to principles of economy especially through the budgeting. This requires that projects demonstrate:

    i.   Consistency to budget ratio or percentage given by the call guideline.

    ii.  The proposed expenditure reflects the true cost of the proposed activities.

## Environmental Sustainability

NRF Kenya required project applicants to include environmental sustainability concerns in their project documents. The 'Bio-based Agro-inputs for Sustainability and One Health (BASOH) research on food and nutrition security and sustainable agriculture (FNSSA) is one such project selected for funding by NRF Kenya.

# 3. CONCLUSIONS AND RECOMMENDATIONS

## 3.1    Conclusions

Our analysis illustrates the council's concerted efforts toward attaining research excellence in the funded projects and the entire grants management cycle. Through these commitments, it's clear that the SGCI set targets in relation to the councils trained on RQ+ and those that have demonstrated research excellence in the grants management practices and processes. Importantly, different councils have demonstrated their commitment to research excellence through the different pillars and dimensions, hence the variances in relation to their progress towards research excellence. Several lessons and best practices are outlined herein and will be shared with the other councils.

The following conclusions can be drawn from the findings of this analysis:

1. **High-quality research calls/competitions:** From the foregoing analysis, councils have made deliberate efforts in demonstrating research excellence through designing and managing high-quality research calls/competitions. The councils emphasized several aspects in the research calls and competitions they designed:

    i.   At least 24% of the councils emphasized on solutions-oriented or impact- focused research projects.
    ii.  Councils required projects to demonstrate their alignment with national development priorities.
    iii. Councils called for policy relevant projects.
    iv.  A large proportion (65%) of the councils required the projects to be funded to demonstrate collaborations and partnerships with other stakeholders in the STI system – academia, industry and private sector.
    v.   Innovativeness and multi-disciplinary were other key aspects considered by the councils in the research calls.

2. **Gender equality and inclusivity** is one other key pillar considered by the councils in designing high-quality research calls/competitions. In designing their calls, councils made several considerations to mainstream gender equality and inclusivity. These included, ringfencing specific projects for women researchers, giving gender aspects a significant weight in project proposal evaluations, setting up a minimum quota for women-led research projects as well as encouraging women PIs to apply, ensuring research teams are gender inclusive in terms of team composition. They also ensured that at least 30% of the evaluators were female. Given these strategies, our analysis shows that overall, 12 SGCs (71% of the councils) – Botswana, Tanzania, Mozambique, Kenya, Ethiopia, Senegal, Sierra Leone, Ghana, Zambia, Rwanda, and Cote d'Ivoire – have funded projects dedicated to women, are women-led (female PIs) or ring-fenced for women researchers.

3. **Inclusivity:** Through their commitment, councils have made significant progress in mainstreaming inclusivity in the design and management of research and innovation competitions/calls. Councils set to enhance inclusion of students and early career researchers (ECRs), as well as actors in the informal and private sectors into project applicants' research teams.  Whereas these efforts on inclusivity have been demonstrated in the councils' research calls, some areas that have not been given enough attention. These include the informal sector, research institutions, and early career academics.

4. **The Use of Online Grants Management Systems (OGMS):** To enhance research excellence, one of the key initiatives undertaken by the councils is the adoption of an online grants management system for handling research calls and related processes. At least 35% of the councils have already committed to using this system to manage calls.

5. **Scientific rigour:** A number of councils required project applicants to consider the two aspects of scientific rigour – protocol and methodological integrity. Specifically, some councils required the project applicants to clearly outline the proposed methods, analytical techniques and their appropriateness. For some councils, scientific rigour entailed demonstrating adequacy and feasibility of the research methodology/approach and the specific activities. In addition, some councils define research excellence according to the strictest principles of transparency, openness, quality, fairness, managing conflicts of interest, and confidentiality regarding individual proposals and review outcomes. The competence, expertise, and experience of the principal investigator are also considered essential indicators of scientific rigour, a key dimension in demonstrating research excellence.

6. **Knowledge accessibility and sharing.** Achieving some aspects of research excellence also includes the accessibility and sharing of knowledge produced from the funded projects. Therefore, the councils have required applicants to outline dissemination plans, specifying both the venues and the formats in which project results will be shared. In addition, it is important the projects funded to illustrate adequate potential for uptake/application of the results which thus requires a clear communication and outreach strategy.

7. **Capacity building and mentorship:** Capacity building within the funded projects was identified by some councils as one of the dimensions to improve research excellence. In this case, some councils require the projects to illustrate how they will enhance human and institutional capacity as well as enhancing the physical infrastructures for R&D. Some of the projects selected by the councils for funding deliberately included MSC students and junior researchers to be mentored within these projects.

## 3.2　Recommendations

Based on the findings and conclusions, the following recommendations are proposed:

1. **Capacity building of the councils and their grantees:** The SGCI should continue strengthening the capacity of the councils – and, by extension, their grantees – by deepening their understanding of research excellence and its key pillars, including the design of high-quality research competitions/calls and the Research Quality Plus (RQ+)

2. **Open access support:** It is important to support the councils in strengthening their communication strategies and ensuring open access to the research they fund. This will promote knowledge sharing, increase the visibility of research results, and play a crucial role in advancing research excellence through greater knowledge uptake.

3. **Capacity building and Mentorship:** To enhance research excellence, the SGCI should consider supporting councils to fund projects that would enable grantees to build the human and institutional capacity (i.e., involve postgraduate students and early career researchers in research projects.

4. **Online Grants Management Systems (OGMS):** Inasmuch as some councils have employed the online grants management system in the management of the research calls, it is important that more councils are encouraged and/or supported to adopt the OGMS in their grants processes.

# 4. References

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