Request for Proposals (RFP)

Grant Title	**Innovative frontier technologies for climate resilient agriculture, food security and safety in Africa**
FUNDERS:	• Government of Rwanda through National Council for Science and Technology (NCST) • Grand Challenges Africa through Science for Africa Foundation (SFA)
Contacts for Enquiries:	NRIF Département, NCST Tel:+ 250 0781 030 798 e-mail: research@ncst.gov.rw
Webpage url	https://rigms.ncst.gov.rw Research and Innovation Grant Management System (RIGMS)
Budget	Rwf 100,000,000 for Seed projects (proof of concept projects): for a period of up to 18-24 months
Languages	English
Funding Purpose	The purpose of this grant is to provide funding to researchers and innovators to carry out research in Rwanda and Africa; broadening opportunities for collaboration between academia and private sector focusing on use of frontier/emerging technologies for agriculture discovery and innovation towards food safety and security in Africa. The main Goal is to support the most creative scientists in Rwanda to implement research that fosters innovation and promotes collaboration in solving the most critical development challenges in Rwanda and Africa

1. Background

In most African countries including Rwanda, food security and food safety are important to ensure food availability, accessibility, affordability and food safety for all while increasing demand for healthy and nutritious diets. As changes in weather and climate patterns are becoming more acute, there is a need to build resilience through on-farm measures and enable actions to increase productivity. Developing food systems that contribute to environmental sustainability Advances in use of emerging technologies such as imaging and associated data analytics; use of drone technology and robotics; artificial intelligence (AI), Internet of things (IoT); Big data and others can galvanize climate-resilient agriculture for improved food security. This can be achieved using existing natural resources through crop and livestock production systems to achieve long-term higher productivity and farm incomes under climate variabilities. Application of frontier or emerging technologies can lead to improved climate resilient agriculture that is robust and adaptable to the changes in environmental, economic, and social challenges in Africa. In addition, emerging technologies can be used to develop better capacity to stimulate and enable communities, businesses to respond, withstand or recover from climate change disruptions such as extreme weather, drought, and flooding. Both emerging technologies and renewable energy climate resilient developments (e.g.: wind energy, bioenergy, solar energy, geothermal energy, smart energy systems) can be adapted for better food security enabling improved availability, access, utilization and food surplus for export and/or processed for storage and future use.

In order to achieve agricultural development goals and targets aligned with Africa Agenda 2063, it is imperative to address the current and emerging social, economic, and environmental challenges affecting food safety and security in Africa. The need for research and innovation for improved climate resilient agriculture requires novel ideas, innovative approaches and greater levels of multilateral co-operation among key players in Africa within various sectors, especially academia and industry as well as farmers' knowledge and skills to support specialization, intensification, diversification, and value addition. Innovation and digitalization are playing an increasingly important role in all sectors and in the daily lives of citizens in Rwanda and Africa in general, but also in most low-and middle-income countries (LMICs). As such, the role of Research and Development (R&D) to generate and deepen knowledge leading to innovation is imperative, and central to Rwanda's Science Technology and Innovation (STI) policy, and most African policy agendas.

The purpose of this grant is to provide funding to researchers and innovators to carry out research in Rwanda and Africa; broadening opportunities for collaboration between academia and private sector focusing on use of frontier/emerging technologies for agriculture discovery and innovation towards food safety and security in Africa. The main Goal is to support the most creative scientists in Rwanda to implement research that fosters innovation and promotes collaboration in solving the most critical development challenges in Rwanda and Africa.

2. Focus and priority areas

Rwanda, like many other African countries, faces the challenge of feeding its growing population while adapting to the impact of climate change. This Request for Proposals (RFP)

specifically focusses on **climate resilient Food safety, security & modern agriculture** to accumulate value in the form of innovative products, services, processes and solutions using modern and high-technology through collaborations that are significant inputs to the creation of knowledge-based economies able to drive continental economic transformation and competitiveness.

Food safety, security and modern agriculture is a major sector of the African economy, and its modernization improves living conditions of farmers, increasing exports and growing agro-processing industries, and increasing the continental food security. In an effort to increasing food security it is worth noting that climate change and food security have an immutable link. Climate change has a cascading impact from agroecosystems to agricultural production, to the people and countries and ultimately consumers depending on reliable food production and availability. Most African countries have invested substantially in agricultural research to increase GDP and reduce trade deficit, and improve Africa food security. However, sustainable adequate and climate resilient and safe production of food remain a challenge. Further research is essential to responding to existing food security challenges in the face of climate change.

United Nations Conference on Trade and Development (UNCTAD) 2021 report predicts that in 2030 the frontier of technologies will contribute most to global market size. The report labelled ***'Technology and innovation report 2021: catching technological waves, innovation with equity'*** indicates that artificial intelligence (AI), robotics, biotechnology, 5G, data science and analytics, nanotechnology, gene editing, 3D printing will contribute tremendous potential for sustainable development to over $3.2 trillion market size, a 10-fold increase from 2018 to 2030. The funding opportunity will support research fostering excellence under **Food safety, security & modern agriculture** as a priority area, and preferably focusing on application of frontier technologies to develop technology and innovation resulting in product and services that will transform African national economies and modernize the lives of Africans. The goal is to conduct research that explores how African countries can reimagine their food systems as innovation systems with attention to the adaptation to climate change and building of local innovative capabilities, enabling infrastructure for agricultural innovation, developing coherent sustainable collaborations and strengthening knowledge flows to facilitate technology dissemination.

3. The Challenge

This RFP considers innovative research and technological solutions to enhance food security and resilience in Africa. The proposed projects should be in alignment with focus on research and innovation growth that increases the continent and country's food security, while utilizing emerging technologies to increase for example agriculture productivity and efficiency and increasing exports and growing agro-processing industries.

We seek to support integrated innovative solutions that combine scientific, technological and social aspects through multidisciplinary research collaborations. We strongly encourage collaborations as we believe that the boldest ideas can originate from a broad spectrum of players inducing research and academic institutions, private sector and non-profit

organizations. The projects will be led by investigators from Rwanda and Africa through collaborative approaches.

Through this Request for Proposal (RFP), Rwanda National Council for Science and Technology (NCST) together with Science for Africa Foundation (SFA) and Grand Challenges Rwanda with Grand Challenges Africa intend to promote intra-African research collaborations to enable African researchers and innovators from academia and private sector to carry out collaborative research with innovative approaches to enhance climate adaptation for agriculture in Africa. We are looking for seed grants that can be delivered within 18-24 months and address the objectives below.

Specifically, the objective of the challenge will be:

- Promoting sustainable and resilient production systems for crops and animal resources through modern agricultural technologies such as smart and precision technologies, next generation technologies, for increased food productivity, diversity, sustainability and climate resilience of agricultural production
- Promoting land husbandry technologies for soil health fertility and biomass management
- Promoting climate-smart solutions anchored in science, technology and innovation (STI) – including the use of precision agriculture and early warning systems to mitigate food instability
- Promoting climate Smart technologies and techniques for Post-harvest losses handling and management
- Improving agro-processing technologies for more nutritious food (fortification) and better food accessibility.
- Strengthening Research and Innovation systems that promote high-potential livestock and aquaculture
- Promoting the use of new and emerging technologies such as artificial intelligence (AI) that have potential implications for the future of crop and livestock agriculture.
- Promoting data-driven agriculture as next frontier of crop and livestock agriculture

This RFP seeks to harness the potential of STI and the use of frontier technologies for research to enable food security that requires investments in R&D, human capital, infrastructure development and knowledge flows through collaborations between African scientists at various Universities and research institutions in partnership with private sector. The scheme aims to create an environment for agricultural innovation in Africa that benefits from an enabling national and continental environment, gender-sensitive approaches to technology development and dissemination, regional and international collaboration, and technology foresight and assessment for agricultural innovations.

4. Funding level and description

This RFA funding will support highly innovative research projects to improve research output in sub-Saharan Africa (SSA). The program will specifically support seed projects (proof of

concept projects) – studies that have a new idea that needs to be validated and data collected to support or confirm the idea – Rwf 100,000,000 for a period of up to 18-24 months.

5. Eligibility Criteria

What We Are Looking for:

We are looking for projects that meet the stated objectives above, and applicants abide with the following eligibility criteria:

- Are led by a Principal Investigator (PI)/Program Director (PD) with scientific excellence in relevant field and based and working in Rwanda. Teams working with other African institutions within or across countries will be given preference over applicants from single institutions. Other global partners may be included.
- The applicants must demonstrate an anchor within any of academic institutions, research centres, non-profit organizations, or for-profit organizations. For-profit organizations will, however, not be allowed to charge indirect costs. Partnerships with the implementers / end-users, are important and there is a need to avoid developing solutions without clear demand and consideration of user needs. Applicant(s) must provide support letter from their primary university, research institute or R&D company where the research project will be carried out. The letter shall state a) support by head of institution, b) justification of employment to applicant PI/PD.
- We particularly encourage applications from women-led projects and organizations. Moreover, as a general rule the composition of the project team shall be at least 30% of women;
- Demonstrate that at least 80% of the funding goes to Rwandan institution(s) and 20% for regional and international collaborations.
- Applicants must provide support letter from each partner institution in Rwanda, Africa and globally expressing commitment by the institution to support implementation of the project;
- The research project proposed should have the potential to lead to product or service development, and the potential for commercialization of products of services.
- The research project should describe clear community outreach activities or strategy for dissemination so that wider Rwandan/African community understands the project and its findings e.g. through Radio, TV and newsletters, etc.

We Will Not Consider Funding for:

We will not fund projects that meet *any* of the following criteria:

- Projects that do not demonstrate that the majority of the work proposed will be undertaken by Rwandan or people working in Rwanda in collaboration with African and international scientists at Rwandan institutions.
- Basic research purely focused on research tools/methodologies that do not provide a clear path to development and testing of approaches that do not lead to proof of concept and measurable outcomes or impact of enhancing the agriculture towards food security and safety.

- Products or tools intended for use by individual or small groups of (<100) small scale producers.
- Solutions that are only variations of existing approaches or repetitions of conventional solutions without novel application, e.g. replication of an approach in a new geography in the absence of added innovation.
- Projects that do not clearly consider the current contexts and relevant socio-cultural, economic, climate, environmental and infrastructural constraints of available services/systems.
- Wide and unfocussed projects that do not have acceptable climate adaptation-specific objectives doable within 18 - 24 months
- Are fronting projects and are without local development, ownership, and delivery.
- Cannot demonstrate a clear development plan for their project to attain scale in future –
- Training or educational programs or campaigns without clearly articulated, measurable behavior change outcomes.
- Ideas that present ethical or safety risks.

6. Evaluation Process and criteria

● Administrative screening

NSCT and SFA will constitute an administrative screening team consisting of its internal review committee established by NCST senior management staff and other partners and experts from SFA supporting the call. Applications that do not meet the eligibility criteria outlined will be removed from the list whereas applications that meet eligibility criteria will be forwarded to the external peer review stage, and applicants will receive a message that their proposals have been forwarded to reviewers and that there are under review process. Ineligible applications shall automatically be disqualified and applicants will be notified through Research and Innovation Grant Management System (RIGMS) that their proposals were declined with some feedback (where applicable) on why they were rejected.

● Independent/ External Review

Funding partners will be given an opportunity to nominate reviewers for the reviewer committee. To avoid bias, proposals will be sent to reviewers without the applicants' personal and organizational information. Each proposal will be sent to at least 3 reviewers with broad expertise and a track record of accomplishment in research, innovation and technology development in the areas highlighted in this call.

A committee will be composed of three (3) reviewers per application, and the scores will be calculated to obtain an average score for each application. The composition of the three (3) reviewers shall be at least one (1) reviewer from industry and one (1) from outside Rwanda.

Through RIGMS the appointed and independent reviewers and researchers shall be anonymous to provide opportunities for better objectivity in the review process.

The reviewers will provide quantitative scores and qualitative information describing rationale for the scores provided to each grant, which will be shared through RIGMS to each of the applicants.
The aspects to be considered in the selection step include:

- **Alignment to national priorities** shall be required to maximize potential for impact

- **Feasibility** (work plan, project organization, project scheduling and timelines)
- **Scientific merit** of the proposal (including the literature review, objectives, methodology, novelty, scientific contribution, multidisciplinary aspects, industry collaboration)
- **Experience and competence** of the PI and project team shall demonstrate experience in carrying experimental studies.

The final selection will be based on the recommendations of the review committee criteria underneath. Reviewers will consider each of the review criteria below and award scores equally to determine scientific merit of the following areas:
a) Significance (national context) b) Approach (feasibility of objectives and milestones) c) Innovation (creativity of the project's approach and clear differentiation from existing approaches), d) investigators competence (track record of research team members conducting similar studies) and e) Research environment (current institutional equipment and physical resources to carry out this study). After the expert review process, all proposals along with the respective experts' comments will be submitted to the Award Committee for review and final selection of successful proposals.

Each application will be evaluated and rated based on criteria outlined below. The evaluation criteria listed are closely related and are considered as a whole in judging the overall quality of an application.

Scoring:

Assessment:	**Marks**
Relevance and significance: The proposal should demonstrate how the study will contribute to sustainable innovation and product and or service development. Statement of the problem and justification of the study should be well elaborated to justify potential for innovation. **Goals and objectives stated shall be clear and measurable, and the pathway to outcome and impact for innovation shall be well defined.**	10
The Research should demonstrate scientific and technological excellence and Innovation: The proposal should clearly define the uniqueness of the **research idea, product or servic**e to be developed addressing specific community scientific challenge or need in a specified priority area. The proposal should clearly define the quality and **originality/novelty of the innovative idea that will lead to product or service to be developed**, and its potential for commercialization.	25
Demonstrate the potential for product/service development, job creation: The proposed **research shall be experimental development** and demonstrate the ability for PI and Co-PIs to have product/service developed. The applicant shall **demonstrate how the research will contribute to job creation.**	20
Investigator's capacity, qualification and record on previous grants, **Partnerships and collaborations:** Investigators must have and **demonstrate expertise** in the stated field through **prior research experience and collaboration,** and they must show the ability to undertake the research. The proposal must demonstrate the contribution of the participating institutions **and clearly define the roles of each**	10

partner towards ensuring research excellence and innovation capacity development.	
Quality and Feasibility of the project Idea: The project **idea and feasibility is well developed**, with details about how the **project activities will be carried out and outcomes achieved.** Indicate how ethical considerations and issues expected and arising from research (if any) will be addressed.	12
Budget and timeline: The budget justification is detailed. **Costs are reasonable in relation to the proposed activities and anticipated results.** The budget is realistic, accounting for all necessary expenses to achieve proposed activities within the set timeline. Using the provided template and guidelines should be respected.	7
Monitoring and evaluation plan: Applicants must demonstrate ability to **measure the project success against key indicators and provide milestones** to indicate progress toward goals outlined in the proposal. The project includes output and outcome indicators and shows how and when those will be measured.	8
Sustainability: Project activities are likely to have a positive impact after the end of the project and funding for continuation of the project if needed must be sought from other funding bodies.	8

7. Required documents

- Completed online application form (obtained from RIGMS)
- Completed proposal template
- Completed Activity plan template
- Completed Proposed Budget template
- Justification budget for personnel work at industry
- CVs of the PIs, Co-PIs and team, and their relevance to the project
- Commitment letters of team members merged into a single pdf file
- Support letters for PIs and Co-PIs provided by head of institutions
- Proof of registration for private companies/NGOs
- List of Partners and their contact phone and e-mails
- Letter from industry/private sector showing commitment of funding support in terms of resources or funds

8. How to apply

Proposals shall only be in English language. Applications can ONLY be submitted online through the Research and Innovation Grants Management System (RIGMS) available on https://rigms.ncst.gov.rw. Only one application is accepted, I you cannot submit more than one application. The applicant must create an account on RIGMS where application templates are available. However, if you have questions or require further information, you can submit your queries via email to: research@ncst.gov.rw.

The user manual of the Research Information and Grant Management System is available on NCST website (https://shorturl.at/nrXY1). Applications submitted outside the system will be automatically disqualified.

9. Plagiarism Check

Funders only accepts submissions of original proposals and plagiarism in any form will not be accepted. All submitted proposals will be subjected to plagiarism checks and hence liable to rejection once identified.

Any text taken verbatim from other sources needs to be identified using quotation marks and proper references. Applicants are requested to pre-check their proposals for plagiarism before uploading to avoid any repercussions at a later stage.

10. Decision making committee

The final decision for funding will be taken by advisory committee made by a team of NCST council members and Partners funders representations.

11. Grant Agreement contract

If grant awarded, a research grant agreement is drawn up between the NCST, the research scientist awardee and the host institution. The agreement consists of the provisions that are to be fulfilled by the parties in regards with implementation of the project and the provision stating the partnership with SFA. **Below are some key elements expected in the GC Rwanda agreement:**

- Grant funds may not be used to reimburse expenses incurred prior to the project start date.
- Project funds may be used to cover the full direct costs of the project. Please read the budget Guidelines or contact the NCST team for clarifications on allowable and non-allowable costs
- Awardees must agree to conduct and manage the project and the products, services, processes, technologies, materials, software, data, innovations, and intellectual property resulting from the project (including modifications, improvements, and further developments to “Background Technology”) in a manner that ensures “Global Access” as shade fined in the grant agreement
- GC Rwanda Call reporting: All GC Rwanda awardees must prepare and submit an Annual and Final Financial and Scientific Reports. Awardees must submit the report electronically by the date agreed on the agreement using templates provided

12. Partner information

Grand Challenges Rwanda through National Council for Science and Technology (NCST) and Grand Challenges Africa through Science for Africa Foundation (SFA) are partners for this grant scheme. The NCST is a government institution with the mandate to advise the

government of Rwanda on STI policies, regulations, set up new priorities, manage the National Research and Innovation Fund but also mobilize funds to promote research and innovation performance and productivity in the country.

Grand Challenges Rwanda is a Program prioritizing funding opportunity to high-level quality ideas by researchers and innovators with exciting ground breaking innovative research projects leading to products and services as unique solutions in areas of i) Food Security and Modern Agriculture ii) Life and Health Sciences iii) Resilient Environment and Natural resources

The Science for Africa, (SFA Foundation) is a pan-African, non-profit, and public charity organization that supports, strengthens, and promotes science and innovation in Africa. The SFA Foundation serves the African research ecosystem by funding excellent ideas in research and innovation; enabling interdisciplinary collaborations and building and reinforcing environments that are conducive for scientists to thrive and produce quality research that generates new, locally relevant knowledge.

13. Important Dates

Key dates	**Event**	**Participants/Notes**
18 May 2023	Call Open	**NCST announces the call**
30 June 2023	Deadline for Submission (call closes at 5:00pm)	
10 July 2023	Pre-selection (administrative check) of received applications	NCST and SFA
31 August 2023	Peer reviews	Independent reviewers.
05 September 2023	Compilation of selection report	NCST & SFA
08 September 2023	Decision Committee	
September & October 2023	Due diligence	
November & December 2023	Notification of outcomes, Signing of agreements and start of project implementation	