Request for Collaborative Research Fund Proposals (RFPs) in the application of Artificial Intelligence and Machine Learning in Agriculture and Health Service Delivery in Malawi, Zambia and Zimbabwe

Call Opening Date: 13th July, 2023

Call Closing Date: 14th August, 2023

1.0 BACKGROUND

The National Commission for Science and Technology (NCST) of the Republic of Malawi, the National Science and Technology Council of Zambia (NSTC) and the Research Council of Zimbabwe (RCZ) are participating in the Science Granting Councils Initiative (SGCI) Phase II-plus. During this phase, NCST, NSTC and RCZ are jointly administering a Grant aimed at managing collaborative research calls in the application of artificial intelligence in agriculture and health service delivery in Malawi, Zambia and Zimbabwe. The collaborative research call will be funded by the African Centre for Technology Studies.

Under this collaborative agreement, NCST, NSTC and RCZ aim to strengthen research collaborations between researchers in the three countries on application of artificial intelligence in agriculture and delivery of health services. It is the vision of this joint collaboration to strengthen the sustainability of health and agricultural systems through artificial intelligence in pursuance of sustainable economies and societies.

2.0 RATIONALE AND SCOPE OF THE JOINT CALL

In a bid to promote the utilisation of emerging technologies in the socio-economic development of Malawi, Zambia and Zimbabwe there is need to leverage these technologies on our existing capacities so as to improve livelihoods. Research collaborations on artificial intelligence in health and agriculture can drive innovation, solve real-world challenges, and bridge the gap between research and implementation. In that regard, the contribution of artificial intelligence in generating sectoral and organizational efficacies and efficiencies is key to developing nations which seek immediate solutions their health and agriculture systems. By bringing together experts from various national boundaries, diverging fields and involving industry stakeholders from the three countries in the research process, it is envisaged that this programme can develop more effective and practical artificial intelligence based solutions that have the potential to transform the health and agriculture sectors of Malawi, Zambia and Zimbabwe.

3.0 THEMATIC FOCUS

Researchers in the area of artificial intelligence directed to health and agriculture in Malawi, Zambia and Zimbabwe will collaborate to prepare trilateral research proposals focusing on artificial intelligence application either in health systems or agriculture. Project proposals submitted under this call may include, but are not limited to, the following research areas:

- Value addition and precision farming;
- Yield production improvements;
- Nutrition Research;
- Microbial Research;
- Medical imaging and diagnostics;
- Precision medicine;
- Healthcare operations and management; and
- Drug discovery and development.

4.0 EXPECTED OUTCOMES

It is expected that interventions of the projects will improve the utilization of emergent technologies in the above stated areas of health and agriculture sectors of Malawi, Zambia and Zimbabwe. Projects should also aim within their proposed duration to enhance the capacity of researchers and relevant sectors in the practicability of artificial intelligence.

5.0 FUNDING LEVEL

The budget limit for project activities in the proposal will be not more than the local equivalent of USD 45,000.00 for the research team in Malawi and Zambia, while in Zimbabwe the budget limit for project activities will be USD 45,000.00. Budget modalities will include three separate budgets, one for each team representative of their respective countries. Collaborative research projects will be implemented for a period not exceeding **nineteen months (19 months) from 2nd October 2023 to 31st July, 2025**. Permissible budget items include the following:

- Material costs, if they are directly linked to the research project, in particular, material of enduring value, the cost of expendable items, field expenses, travel expenses or third party charges;
- Direct costs incurred through the use of research infrastructure linked to the research;
- Costs of organizing conferences and workshops in connection with the funded research; and
- Costs of national and international cooperation and networking activities directly associated with the funded research.

Cost limits for the different research activity categories will include the following percentage of the budget.

- Research costs 65%;
- Equipment 15%;
- Personnel costs 8%;
- Travel & Subsistence costs 2%;
- Workshop costs 2%;
- Konowledge sharing and Research Uptake 5%;

- Other goods and services 2%; and
- Matching support costs 1%.

Note: Salaries of applicants are not eligible costs, however, man-hours for research activities like lab tasks or participant interviewing are eligible under personnel costs.

6.0 ELIGIBILITY CRITERIA

1. Each proposal must have one Principal Investigator from **each country** as a **main applicant** and should be based in Malawi, Zambia and Zimbabwe. The three Principal Investigators will bear the overall responsibility for the projects, including its technical and administrative co-ordination as well as the timely delivery of scientific and financial reports **for each country.**

2. Applications are open to bona-fide researchers from public research and higher learning institutions in Malawi, Zambia and Zimbabwe. Researchers from the Private Sector and Non-profit Organizations registered in Malawi, Zambia and Zimbabwe are also eligible to apply but in collaboration with researchers in public research or higher learning institutions in Malawi, Zambia and Zimbabwe.

3. Support letters from the Malawi, Zambia and Zimbabwe host institutions of the Principal Investigators are a prerequisite. Proposals without institutional approval through support letters will not be considered.

4. The Grant will fund **only Applied Research project** in the listed thematic areas in each country. Research proposals must demonstrate the application of scientific principles or basic scientific discoveries to solve real life challenges. Basic or purely theoretical research will not be considered.

5. Project teams **may** include a PhD candidate. The Grant will provide financial support for the PhD candidate on the project team in their data collection phase **only**.

6. Principal Investigators from Higher Education and Learning (HELs) institutions, Health Institutions and Agriculture Research Institutions in Malawi, Zambia and Zimbabwe are eligible to participate in the call. Private sector and other entities can participate as collaborators.

7. Malawian, Zambian and Zimbabwean Principal Investigators at the point of application must fulfil the following requirements:
   a) Hold a primary appointment in a local publicly funded institution (Minimum of 12 months' employment with a local institution in Malawi, Zambia or Zimbabwe);
   b) Have done previous research in artificial intelligence applied to health and agriculture and have some results published;

c) Be a Principal Investigator with a track record of leadership ability in co-ordinating research programmes;

d) Providing mentorship to research teams, as well as having productive research outcomes; and

e) Should ensure project team composition is inclusive of women and young career researchers.

7.0 PROPOSAL PREPARATION

These guidelines are provided to researchers to develop proposals for possible funding in artificial intelligence applicability in agriculture and health within the above-mentioned thematic areas. Failure to adhere to these guidelines would result in the disqualification of the proposal. Submission of a research proposal does not guarantee funding.

A multi-disciplinary inter-institutional group of scientists from the three countries and from the region with skills and experience in artificial intelligence will be appointed as an independent panel of reviewers. These reviewers may also be called upon to contribute to the assessment of the progress and performance of funded projects. The review process will be be two staged, the first stage will be revuew by external experts and the second stage will be by the Joint Research Management Committee.

Research projects that show potential for high impact at grass root within the project time line at a reasonable cost will be given high priority. Projects that emphasise technology identification and generation, packaging and dissemination for immediate impact on investment and productivity are encouraged. The applicants are requested to use Times New Roman font, size 12, 1.5-line spacing using the Research Proposal Template (*Annexure 1*).

8.0 NCST-NSTC-RCZ EXPECTATIONS FOR INCLUSION IN THE PROPOSAL TEMPLATE

a) Cross-cutting considerations

The proposal should demonstrate how ***gender equality and inclusivity, public-private partnerships, risk management and intellectual property issues will be addressed in the project***. The researchers to also briefly indicate the sustainability plans of their projects after completion of the funding. Submissions of research projects led by women Principal Investigators are strongly encouraged.

b) Results and Dissemination

Applicants should clearly define the major outputs expected from the research project and describe how the research findings will be disseminated or used. Who are the target audience/ beneficiaries? How will the findings be used to influence policy and practice? What media engagements plans are envisaged? Indicate how open access will be fostered. Relate the specific dissemination method/approach to the target audience and briefly explain the rationale for the choice of the approach.

c) Team composition from applicant organizations

All individuals who make a significant contribution to the intellectual direction of the research, and who may have some responsibility for financial aspects of the project should be listed. Team

members from applicant organisations should be included. It is important to include the field of expertise of each individual, as well as the percentage of their professional time committed to the project. Do not include CVs of the entire research team, but include a one or two paged CV for the Principal Investigators. Letters of support from the institutions of the PI should be included.

d) Budget

This should include an explanation and justification for each line item in the detailed budget spreadsheet. The maximum budget is as stated in section 5.0 above. Presentation of detailed budgets is a must. Any personnel costs should include a clarification of the roles and responsibilities of key researchers and percentage of time devoted to the project. The research grant will not cover salaries for the project team members. All rates to be used for the budgeting purpose are the ones acceptable by the respective institutions of the Principal Investigators hosting the projects. Some of the project downstream budgetary items could include the following:

- Research specific costs including cost of equipment;
- Costs associated with human resources;
- Capacity building e.g. postgraduate;
- International and local travel;
- Monitoring and evaluation; and
- Dissemination of research results.

e) Project Governance

Briefly explain how the project will be governed. What is the composition of the research team, their qualifications and specific roles in the proposed project? Describe how any partnership is planned with other universities/ research institutes? How will the private sector or beneficiaries be involved in the design/management/execution of the project? What is the role of the university's/institute's management (if any) and how might this governance structure influence the success of the programme?

f) Proposed Project Timeline

Provide a chart of key activities, timelines and key milestones.

g) Monitoring and Evaluation

ACTS, NCST, NSTC and RCZ will be responsible for monitoring and evaluation. Successful applicants will be provided with Reporting Templates to aide monitoring and evaluation.

h) Ethical clearance

Where the project involves human participants and animal subjects, the Principal Investigator in the respective country shall obtain ethical clearance from an appropriate NCST, NSTC and RCZ designated research ethics committee before any grant disbursement and implementation of the project. NCST, NSTC and RCZ will also ensure that the ethically cleared research projects have been inspected for ethical compliance in the field besides the ordinary monitoring and evaluation.

9.0 SUBMISSION AND PROCESSING OF PROPOSALS

The mode of application and submission of the full application package (i.e with all the required attachments) shall primarily be through the **web-based online grants management system** of both NCST at https://grants.ncst.mw/; RCZ at https://rczgrants.org/ and NSTC at https://nstcms.nstc.org.zm/web/. Application packages submitted **via email** will NOT be accepted under this Grant scheme.

The deadline for submission is **14th August, 2023 at 17:00 Central Africa Time.** Application documents uploaded on the Online Grant Management System must include full proposal; project team CVs; work plan; and budget. All attachments must be in PDF.

a) Proposal attachments uploaded to the Online Grants Management System should not exceed fifteen (15) pages, using 1.5 spacing and font size 12 Times New Roman **(Refer to the proposal template available on the relevant Online Grant Management System for other details)**.

b) All proposals will be received and processed in strict confidentiality and with complete acknowledgment of Intellectual Property Rights of the applicants.

c) Proposals will be screened for completeness by both NCST, NSTC and RCZ before a rigorous review by an independent panel of reviewers.

d) Evaluation, selection, approval and communication to successful applicants by respective Boards of NCST, NSTC and RCZ will be by **31st August 2023**.

e) NCST, NSTC and RCZ's decisions will be final.

10. CONTACT INFORMATION

Any enquiries from Malawi researchers should be directed to Mr Kondwani Gondwe at kgondwe@ncst.mw. Enquiries from Zimbabwe researchers should be sent to Ms Zolisa Gumede at zgumede@rcz.ac.zw .Enquiries from Zambia should be sent to Atridah Mulonga on srf@nstc.org.zm.

11. IMPORTANT DATES

- Application period commences on the 13th July 2023.
- The deadline for submission of Full Proposals is the 14th of August 2023 at 1700 hours CTA
- Evaluation of detailed proposals: 15th of August 2023 to 15th September 2023
- Deliberation / proclamation of results: 21st September 2023 to 22nd September 2023
- Award notification to the winners: 21st September 2023 to 23rd September 2023
- Signing of grant contracts: 25th September 2023 to 27th September 2023
- Initial disbursement of the approved budget: 28th September 2023 to 29th September 2023
- Funded research projects will be implemented over a period of two years from 2 October 2023 until July 2025
- Final report: 28th August 2025
- Project Financial Audit: 30 September 2025

ANNEX 1: PROPOSAL FORMAT/TEMPLATE

The full proposal in any of the priority areas should be prepared in the following format and address elements therein.

1. EXECUTIVE SUMMARY

This section provides a succinct high-level summary of the proposed project. The summary should be in plain English, avoiding the use of jargon and acronyms. Please note that this summary will be published in the SGCI Virtual Hub and partner institutions websites. The summary should be short but detailed enough to stand alone. It must not be more than one page long.

2. BACKGROUND AND RATIONALE

Describe the problem that is to be investigated and the questions that will guide the research process. Provide a brief overview of the body of knowledge related to the problem and indicate the knowledge gaps that the proposed research will fill. To show the importance of the problem, this section should discuss: how the research relates to the country's development priorities; the scientific importance of the problem; the urgency and magnitude of the problem and how the research results will contribute to its solution; the special importance of the project for the private sector; and the need to build up research capacity in the proposed area of research.

3. PROJECT GOAL AND SPECIFIC OBJECTIVES

The overall goal should state the development goal being pursued by the research. The specific objectives should indicate the specific types of knowledge (or other outputs) to be produced/realized, the audiences to be reached, the forms of capacity to be reinforced, and the partnerships to be established. These are the objectives against which the success of the project will be judged.

4. PROJECT METHODOLOGY/ APPROACH

Explain how each specific objective will be achieved in sufficient detail to enable an independent scientific assessment of the proposal. This section should show how the research questions will be answered in the most rigorous way possible. You must be clear about the activities envisaged to achieve each objective. The methodology (which should be justified) should discuss the following details as appropriate:

- **Conceptual and theoretical framework**. Define the frame of reference that will guide the research (for more on this see section on innovation systems).

- **User participation**. Indicate whether (and if so, how) the ultimate users of the research findings (in this case, the private sector) were involved in the design of the project and how they will participate in the execution of the project or implementation of the results.

- **Data collection.** Indicate the approaches and methods that will be used to collect data as well as how the research instruments will be developed. If the research includes studies on human populations, indicate how ethical questions relating to confidentiality will be achieved (see below). Where applicable, details must be provided with regard to the collection and handling of biological samples, and all laboratory procedures and protocols must be stipulated.
- **Data analysis.** Describe the methods of data analysis and modeling to be used, if any. This should include any statistical processes/ softwares (if necessary) as well as how the data will be secured, accessed, shared, stored and archived.

5. ANTICIPATED OUTPUTS AND OUTCOMES

Define the major outputs (e.g., publications, policy briefs, books, technologies, protocols, guidelines, etc.) expected from the research (please be **specific**.). Based on these outputs, define the outcomes expected. Outcomes are defined as changes in actions, behaviours, and relationships of the users and target audiences. What is likely to change as a result of research findings, to whom, when and where? Describe whether the project findings are likely to influence policy and at what levels (national, regional?) How will the project engage with policy and decision actors at these levels?

6. KNOWLEDGE UTILIZATION AND DISSEMINATION PLAN

Describe how the research findings will be disseminated or used. Who are the target audience/ beneficiaries? How will the findings be used to influence policy and practice? What media engagements plans are envisaged? Is open access (OA) part of your university's/institute's policy? Relate the specific dissemination method/approach to the target audience and briefly explain the rationale for the choice of the approach.

7. PROJECT GOVERNANCE

Briefly explain how the project will be governed. Describe whether the project plans to incorporate advisors to provide overall oversight. What is the composition of the research team, their qualifications and specific roles in the proposed project? Is any partnership planned with other universities/ research institutes in your country (if the focus is national); or in other countries (if the focus is regional)? How will the private sector and other beneficiaries be involved in the design/ management/ execution of the project? What is the role of the university's/institute's management (if any) and how might this governance structure influence the success of the programme?

8. SUITABILITY OF THE HOST INSTUTUION

Describe the suitability of your institution in coordinating this project by highlighting the specific factors that make it uniquely qualified. Provide an overview of the technical infrastructure, human capacity, and other resource endowments that demonstrate the existing capacity to undertake the proposed research. Explain the institution's previous/ current activities, outreach and impact in the proposed area. Describe any existing or anticipated links with the **private sector** and other actors in the country/national system. Briefly demonstrate how this project will fit into the overall design of the university's/institute's overall research strategy

9. CAPACITY BUILDING

Describe how the project plans to contribute towards both individual and organizational capacity building. How might post-graduate students (MSc. and PhD) be involved in the project? What other training activities are envisaged under the project? Are their plans to enhance the capacity of project partners (and if so, in what areas)?

10. MONITORING AND EVALUATION STRATEGY

Describe the monitoring and evaluation strategy approach that the research team will use for monitoring and evaluation of the research project.

11. GENDER, ETHICS AND SUSTAINABILITY

Describe how ethical approval will be obtained, if applicable. All projects that include human subjects must ensure that their privacy, dignity, and integrity are protected. Projects that will collect corporate or personal information must detail how informed consent will be obtained and confidentiality maintained.

Carefully describe the links of the proposed project to ongoing projects within the institution (regardless of whether these projects are undertaken by the PI). If the project builds on other funded projects then provide accurate and verifiable information about the funding sources and whether the proposed activities are new. Explain how the project will be sustained beyond the project support. Are any donor partnerships anticipated, and if so, which ones? Provide details of any ongoing discussions with other funders, if applicable.

Identify the key risks that may arise during the implementation of the proposed research and how each will be addressed. For each potential risk, outline the key assumptions and a mitigation plan.

12. PROPOSED PROJECT TIMELINE

Provide a chart of key activities and timelines as below

Project Activities	Year 1				Year 2			
	Q1	Q2	Q3	Q4	QI	Q2	Q3	Q4