

Makerere University Research and Innovations Fund (Mak-RIF) is an endowment from the Government to the institution to support high-impact research and innovations to help drive Uganda's development agenda. Prossy Nandudu asked Prof. Fred Masagazi-Masaazi, the chairperson of Mak-RIF Grants Management Committee, about the fund and what they have been able to accomplish.

Enhancing Makerere University's research agenda

Can you briefly tell us what Mak-RIF is all about?

Makerere University Research and Innovations Fund, commonly known as Mak-RIF, is a scheme funded by the Government of the Republic of Uganda, to support high-impact research and innovation.

This unique initiative was realised in 2019 after engagements between the top university management and the Government. The fund illustrates the increasing importance that the Government attaches to research and innovation as a driver of development and transformation. The objective of the fund is to increase the local generation of translatable research and scalable innovations that address key gaps in order to drive Uganda's development agenda.

What is the Government's contribution in monetary terms?

Each financial year, Makerere University expects to receive at least sh30b (about \$8.1m) under the Government Research and Innovations Fund (RIF). The Government has committed to provide this funding for at least three financial years. A framework for management of the government research and innovation funds was developed and has been implemented since 2019. In addition, a multi-disciplinary Grants Management Committee (GMC) was appointed by the university after wide consultations with all the colleges. The funded research and innovation projects are expected to generate actionable results that speak to national priorities.

How does a project qualify for a grant?

Working with internal and external multidisciplinary reviewers, the GMC vets, selects and issues grants to teams that demonstrate a clear link to the Government and its implementing partners on key development research gaps. The RIF-GMC's terms of reference include development of an instructive research agenda as the basis for identifying funding priorities. This research agenda lays out the research priorities to be funded by the Mak-RIF. It is laid out in forms of themes based on different sectors as well as sub-themes within each sector.



Prof. Masagazi-Masaazi

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All funded projects should be aligned to the research agenda. Our research agendas are developed through a rigorous process which includes the GMC conducting a comprehensive review of documents and conducting stakeholder consultations.

I will cite the example of the current research agenda we developed, where we reviewed the National Development Plan III, the Makerere University Strategic Plan, the Makerere University Research Agenda and other related policy documents from other sectors.

The stakeholder consultations included two workshops: One with representatives from key government ministries/sectors and semi-autonomous government agencies and the other with the private-for-profit sector

and civil society. The GMC triangulated this information with that from the literature review. The information was then synthesised to develop the 14 thematic areas prioritised for funding.

Can you tell us some of those thematic areas that RIF targets?

Mak-RIF funding thematic areas include: transforming the agricultural sector, sustainable health, re-imagining education, water, sanitation and environmental sustainability. It also includes harnessing the social sector to drive development, harnessing tourism, wildlife and heritage to drive development, sustainable planning, finance and monitoring, leveraging public service and local administration for efficient service delivery. Others are manufacturing, science, and technology as tools to accelerate development, catalysing business and enterprise, energy and minerals as drivers of rapid economic development.

What kind of projects does the fund target?

Mak-RIF funds all disciplines and groups of people, with principal investigators being largely Makerere University staff. The multidisciplinary research teams include students, practitioners, policy makers and implementers and other stakeholders.

Give examples of some of these projects and how they have contributed to the objectives of the innovation fund.

Examples include: Enhancing Value Addition on potato-sorghum enterprises for Improved Livelihoods in Uganda; A Randomized Control Experiment, Integrating refugees Into Economic Activities Through Mobile Entrepreneurship Skilling and the low-cost medical ventilator - Bulamu Ventilator, among others.

Mak-RIF has funded over 750 research and innovation projects since its inception in 2019. Cumulatively, over the last three financial years, Mak-RIF has committed to award projects worth sh94,759,306,363.

Is this fund specific to Makerere University?

This fund is not for only Makerere University

Mak-RIF Funding Thematic Areas		
Thematic area	Number funded	%
Transforming the agricultural sector	131	17.3
Sustainable health	291	38.6
Re-imagining education	76	10.0
Water, sanitation and environmental sustainability	48	6.4
Harnessing the social sector to drive development	27	3.6
Harnessing tourism, wildlife, and heritage to drive development,	22	2.9
Sustainable planning, finance, and monitoring	9	1.2
Leveraging public service and local administration for efficient service delivery	24	3.1
Defence and security: Achieving sustainable peace and stability	9	1.2
Strengthening law, governance, human rights, and international cooperation	9	1.2
Harnessing Information and Communication Technology to drive development	21	2.8
Manufacturing, science, and technology as tools to accelerate development	18	2.4
Catalysing business and enterprise	40	5.4
Energy and minerals as drivers of rapid economic development	29	3.8

Money committed to research and innovation projects since the project started			
Call	Applicants	Awardees	Allocation (UGX)
Round 1			
1. RIF round 1 - National priorities	704	224	27,529,374,724
2. Special COVID-19 Grants	356	112	6,409,861,844
3. RIF round 1 Needs Responsive	-	3	887,676,000
4. COVID-19 Needs Responsive	-	10	3,243,292,195
Grant Administration	-	-	2,470,625,276
Sub-total committed	-	-	38,070,204,763
Round 2			
5. RIF round 2 -National Priorities (Resubmission)	-	67	9,695,611,865
6. RIF round 2 National Priorities	386	160	15,257,177,578
7. RIF round 2 Needs Responsive	-	8	2,808,297,130
Grant Administration	-	-	1,928,015,027
Sub-total committed	-	-	29,689,101,600
Round 3			
8. RIF round 3 -National Priorities	482	126	15,046,442,578
9. RIF round 3- Needs Responsive	-	15	3,042,826,559
10. RIF round 3 -Multi-Year RIF-1	50	50	6,427,352,511

even if all the research principal investigators are actively serving staff at Makerere University, but these have co-opted team members from other universities, institutions, ministries, and organisations, among others, to closely work with and execute the project activities.

The project team members also include students who additionally benefit from the capacity building opportunity therein.

Other than the Government of the Republic of Uganda, has the Mak-RIF attracted other donors?

Currently the Mak-RIF is solely funded by the Government of the Republic of Uganda although some of the projects have also benefited from funding from other donors, including the private sector.

Where do you see the fund in the next five years?

We are working hard to ensure that the Mak-RIF fund will grow its wings to fully support the Research and Innovations Agenda in Uganda, East Africa, Africa, and the globe at large.

We have already established a database



Showcasing some of the research and innovation projects at Uganda's 59th Independence celebrations

of over 500 multidisciplinary reviewers, both internal and external, who support the process of reviewing the proposals submitted to Mak-RIF.

These are partnerships we can already leverage for the growth of Mak-RIF.

In addition, it is important for us to continue working to heavily contribute to building capacity of other higher education

Institutions in the country and beyond to carry out research and innovation. We are all working to contribute to Makerere's efforts towards being a research-led university.

This work is funded by Government of Uganda through Makerere University Research and Innovations Fund



Left, borehole automation communal hand water pumps project. Far left, Lubigi channel. Below Mak-RIF college-based Open Days for stakeholder engagement

Mak-RIF projects: A few highlights

BY PROSSY NANDUDU

Climate Change: Improving the prediction of storms and flood forecasting over Kampala City

This study aimed to improve the forecasting of storms (heavy rainfall) that normally lead to flooding in Kampala city due to the frequent flooding events. It concentrated on investigating the relationship between storm characteristics, kinematics, and floods.

A survey of the Kyebando-Lubigi channel flood-prone communities to understand their perceptions and socioeconomic status was done and through modeling.

A dynamic study of the possible predictors of Kampala city rainfall and Uganda, in general, was done to determine the relationship between Kampala rainfall and the large-scale features that affect it.

The project has contributed additional indicators that guide in the forecasting of heavy rainfall events that normally cause flooding in the city. These will improve the quality and accuracy of forecasts.

The findings of this study have been presented to the Uganda National Meteorological Authority (UNMA), Ministry of Water and Environment, and Kampala Capital City Authority.

Nylon Based Litter Management Trap for Drainage Systems

Storm and running water drive trash and debris from two major towns, Kampala and Jinja, into Lake Victoria, the largest freshwater source in Uganda. This causes trash pollution and clogging with silt, polythene bags and stagnant water, which are harmful to marine life. The debris is dropped in drainage channels.

A flexible nylon mesh sock is a reusable, easy-to-empty drainage net designed to capture and retain floating litter, debris, and vegetative matter. The litter and debris trapped in the sock can be removed by untying the base of the sock and dumping the collected material into the Kampala Capital City Authority (KCCA) garbage trucks.

The main objective of the intervention was to fabricate a nylon material based waste trap. The key product was a waste trap sack made from nylon rope.

From the results of waste characterisation and research, we were able to design a nylon-based litter trap of diameter 1200mm, length 1.2m, and strand size 3mm with a diamond shape opening. The average retention capacity of the trap was 55.03kg per hour. From this, it was noticed that the trap takes approximately three hours to fill -up and it was observed that the trap could retain a maximum of 152kg of waste without breaking. Findings were shared with KCCA and the team plans to engage the city authority on the suitability of working with them in the commercialisation of such a product.

Youth Unemployment: A Pedagogical Leadership for Academic Staff in Higher Education Institutions (PLASHE-WIL)

Through this project, academic staff in higher educational institutions are required to implement university curricula using pedagogy that facilitates graduate work readiness and transition to work. However, they have disciplinary and research expertise which do not translate into pedagogical skills for facilitating graduate work readiness.

Therefore, the project is an intervention that sought address the 'pain-point' of graduate unemployment and unemployability.

The project further led to the development of a PLASHE-WIL Post Graduate Diploma Programme which embeds Work-Integrated Learning, which is critical for creating a critical mass of pedagogical leaders who can competently integrate graduate work readiness and transition to work skills in the degree programs, teaching and assessment.

Automation of communal hand water pumps to eliminate COVID-19 transmission (Mak-nai)

This project created an automated solar powered system that can be attached to the borehole to draw water as deep as 100m in 50 seconds. This is a transitional shift from the conventional way of cranking the borehole. The Ministry of Water has partnered with the project to get 10 boreholes into the community.

Integrating assisted reproductive technologies and elite pig genetics to transform the pig value chain in Uganda

The project developed and piloted a new long term semen extender and packaged semen for sale to smallholder farmers in three districts. In the future, the project seeks to produce and package a product from the pheromones of Boars that is able to make sows get on heat (synchronisation) so as to quicken the reproduction process.

This work is funded by Government of Uganda through Makerere University Research and Innovations



Details about Mak-RIF are available on <https://rif.mak.ac.ug>