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PASET
Partnership for Skills in Applied Sciences, Engineering & Technology

Rsif Regional Scholarship and Innovation Fund
Research. Innovate. Transform Africa

icipe

SUB-SAHARAN AFRICA

Population: 1.2 billion (2022)

Research and development expenditures as a proportion of GDP : 0.44% (2007)

Scientific and technical journal articles: 39,578 thousand (2020)

Source: World Bank Data 2023

PAN-AFRICA Report 2023

According to the World Bank, Africa is projected to be the second-fastest-growing region in the world in 2024. The continent has the world's youngest population, thriving through entrepreneurship and innovation. It also holds 30% of the world's natural resources critical for energy transition. Africa has 15% of the world's population, while share of scientific production is just 1.3%.

Contribution to PASET-Rsif

African governments, through the Regional Scholarship and Innovation Fund (Rsif) of the Partnership for skills in Applied Sciences, Engineering and Technology (PASET) are charting the path to Africa's socio-economic transformation by supporting doctoral training, research, and innovation in selected African host universities and collaborating with international partner institutions.

This African led program aims to support the training of African innovators and leaders, with focus on women and faculty, to be able to strengthen the capacity of universities to train at the doctoral level and undertake innovative and impactful research at national and continental level. (*Figure 1*). Through PASET-Rsif African countries are building strong institutions and future science leaders to drive a science and technology-led growth and development.

Why Rsif matters

- **High quality PhD training:** Combining intra-Africa academic exchange and international partnerships for world-class doctoral training.
- **Wider academic and research network:** Research placement at an advanced institution for exposure to cutting-edge technologies and connecting with global research networks.
- **Regional integration within Africa:** Strengthening centers of excellence and innovation ecosystems for benefit of the whole region.
- **Better economies of scale:** Pan-African partnerships, and a jointly pooled science fund professionally managed by the Rsif Regional Coordination Unit at *icipe*.

Rsif at a glance

282 Rsif PhD students (24 nationalities, 37 % women)

15 Rsif African Host Universities in 11 countries with high-quality PhD programs in one of the 5 priority themes

226 Peer-reviewed research publications (>1157 citations)

58 Rsif research and innovation projects

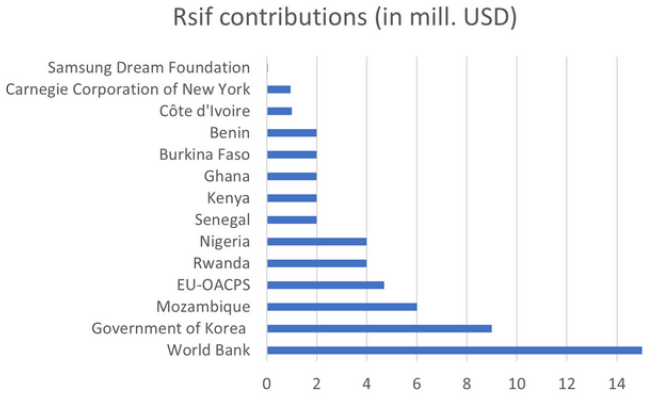

Figure 1: Rsif Contributing Countries and Partners

Rsif thematic areas

- Data science, including artificial intelligence
- Sustainable food systems including agribusiness
- Minerals, Mining and Material Science
- Energy including renewables
- Climate Change

Strengthening research and innovation capacity in Africa

There are 15 competitively selected Rsif African Host Universities (*Figure 2*) hosting 282 PhD students (37% women, 24 nationalities) in high priority sectors.
They are developing skills, generating new knowledge, and developing technologies in thematic areas of climate change, renewable energy, sustainable food systems and agribusiness, digital technologies, including big data and artificial intelligence, and minerals, mining, and materials engineering.

The AHUs benefit from linkages with other African universities as well as the Rsif international partner institutions for the Rsif 'sandwich' programme where students spend 6-12 months at an advanced institution conducting collaborative research *(Figure 3)*. 58 research and innovation projects are under implementation. Rsif also provided video-conferencing equipment, facilities for e-learning and access to a wide range of scientific journals to the university library and its students.

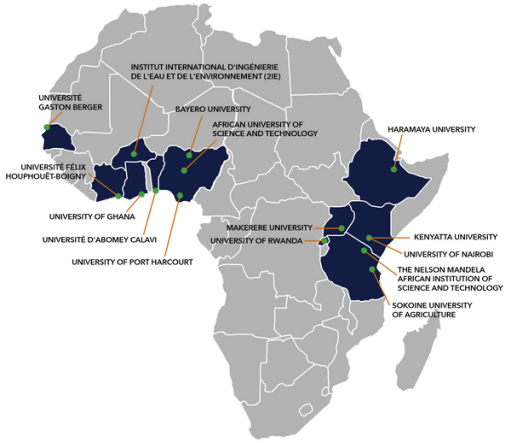

Figure 2: Rsif African Host Universities

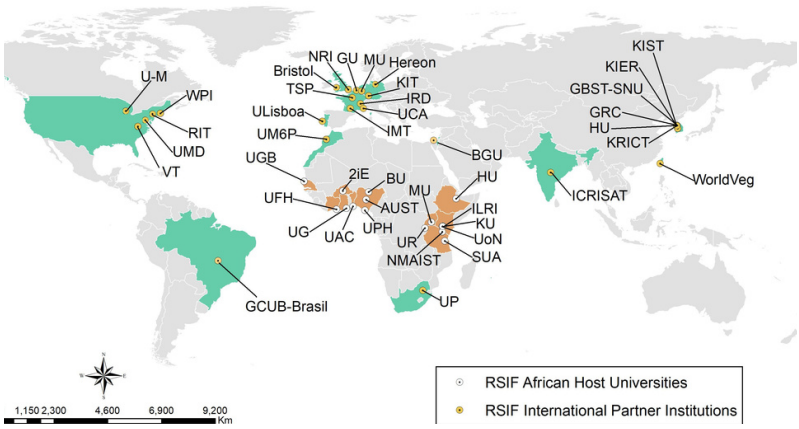

Figure 3: Rsif International Partner Institutions

By working closely with academic institutions, relevant investors and governments, and other stakeholders ; specialized knowledge will be integrated in the region and transferred to the future generation

Spotlight on Rsif scholars

Molecular Microbiology and Antimicrobial Resistance

Dr Noël Gahamanyi (Rwanda) PASET- Rsif alumnus. Director of Microbiology Unit, Rwanda Biomedical Centre (since July 2023). He also serves as a visiting Lecturer of Microbiology related modules at the University of Rwanda.

Dr Gahamanyi graduated from Sokoine University of Agriculture, Tanzania with best post-graduate thesis award 2021-22. His research placement was at the Korea Institute of Science and Technology, where molecular work related to his PhD was conducted. During his PhD journey, he produced eight publications of which five are indexed at PubMed.

Recipient of an Rsif Junior Investigator Research Award (US$ 80,000)

Research area: Prevalence, antimicrobial susceptibility profiles, and genotypes of thermophilic Campylobacter species from humans and animals in selected regions of Rwanda

Due to excessive use of antibiotics in human and animal medicine, there is an escalating number of antimicrobial resistant (AMR) strains. Fluoroquinolone - resistant Campylobacter strains are classified by the World Health organization as one of the priority pathogens requiring the discovery of new drugs.

The research project is expected to (i) reveal the prevalence and genotypes of Campylobacter species in both humans and animals in Rwanda, and (ii) produce antimicrobial resistance profiles of Campylobacter isolates in the country.

The data will help increase awareness on Campylobacter as one of the etiological agents of diarrhea and provide baseline information that can influence AMR surveillance in Rwanda or further studies.

> Investing in training and harnessing excellent science leaders have tangible socio-economic returns for the nation and continent at large

Smart Agri-IoT Technology

Dr Emmanuel Effah (Ghana)

Lecturer at the Department of Computer Science and Engineering, University of Mines and Technology (UMaT), Ghana. PASET-Rsif alumnus from University Gaston Berger, Senegal (2022). Research placement at Worcester Polytechnic Institute in Boston, USA.

Recipient of Rsif Junior Investigator Research Award (U$80,000)

Research area: Robust and Affordable Smart Agri-IoT Technology

Solar Energy Solutions

Ms Mwende Mbilo (Kenya)

Rsif PhD student in Physics at University of Nairobi, Kenya. Research placement at Korea Research Institute of Chemical Technology (KRICT) (2022-2023).

Research area: Design of efficient and stable non-fullerene acceptor-based organic solar cells by buffer layer modification.

Recipient of the 2023 L'Oréal-UNESCO For Women in Science Sub-Saharan Africa Award for Innovating Science to improve solar energy solutions in Kenya.

Wastewater Treatment in Textile Industry

Mr Joshua Ayetade (Nigeria)

Faculty, Federal University of Technology Akure. Rsif PhD student at Nelson Mandela African Institution of Science and Technology in Tanzania. Research placement at Ghent University, Belgium.

Research area: Development of Nano-Size Doped Polyaniline Composites for Catalytic Degradation of Selected Industrial Azo Dyes.

Artificial Intelligence and IoT

Ms Theofrida Maginga (Tanzania)

On study leave from Sokoine University of Agriculture, Tanzania. Rsif PhD student at University of Rwanda. Research placement at the Seoul National University Global Research & Development and Business Center, Korea.

Research area: Convergence of IoT, AI and natural language processing to support low-literacy rural farmers in early detection of crop diseases: Case study of maize in Tanzania.

Gates Foundation Grand Challenges in Artificial Intelligence Grant - (Link to story in New Times)

Rsif awards competitive research and innovation grants that complements the PhD training at African universities by supporting research that promotes scientific excellence and use of knowledge for sustainable development impact.

Developing and scaling up digital innovations in agriculture

Title: Accelerating Inclusive Green Growth through Agri-based Digital Innovation in West Africa (AGriDI)

Consortium led by the Rsif-RCU in icipe under the Rsif innovation window in partnership with the University of Abomey-Calavi, Benin; Gearbox Pan Africa Network and Agropolis Foundation.

Implemented by universities, research institutes and companies in Benin, Burkina Faso, Cote d'Ivoire Ghana and Nigeria.

The Accelerating Inclusive Green Growth through Agri-based Digital Innovation in West Africa (AGriDI) initiative is one of the 12 Innovation Fund projects financed by the European Union through the ACP Innovation Fund of the Organization of African, Caribbean and Pacific States (OACPS). AGriDI aims to create a conducive environment for agri-based digital innovations, especially for women and youth farmers, and accelerating inclusive green growth. Its specific objectives are: a) increased uptake of agri-based digital technologies by farmers' cooperatives and SMEs; b) strengthened collaboration between research communities, industry, and policy actors in digital innovations, and c) improved knowledge on policymaking facilitating scaling agri-business digital innovations.

Photo: Esoko Ltd won the Agri-Tech company of the year award at the Ghana Agriculture and Agri-Business Awards 2023

Some of the products and solutions by AGriDI project partners include the AGriCef mobile App used to control the Fall armyworm (FAW) in maize in Northern Benin and the Ki@ App, also in Benin, that collects and provides relevant market updates via SMS and voice message directly to local farmers via their mobile phone. In South-Western Nigeria a SMARTSOIL App that uses digital soil mapping and AI to provide hyper-local soil information in a way that is easily accessible and affordable to end-users; and in Ghana, the Driving Market Access and Managing AG Valuechains (DigiMakt) used for profiling, and disseminating climate smart agronomic advisory, market information, weather alerts, insurance, and credit scoring for over 12,500 smallholder farmers for financial inclusion through mobile phones in Bono East and Oti regions of Ghana, by Esoko Ltd. Some projects are supporting development of policies on digital innovations in the region.

Photos: ACED Benin research report and policy brief on digital innovations

Contact us

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