



GHANA

Population: 33.5 million (2022)

Research and development expenditures as a proportion of GDP : 0.38% (2010)

Researchers (in full-time equivalent) per million inhabitants : 89 (2015)

Scientific and technical journal articles: 2106 thousand (2020)

Source: World Bank Data 2023

GHANA

Country Report 2023

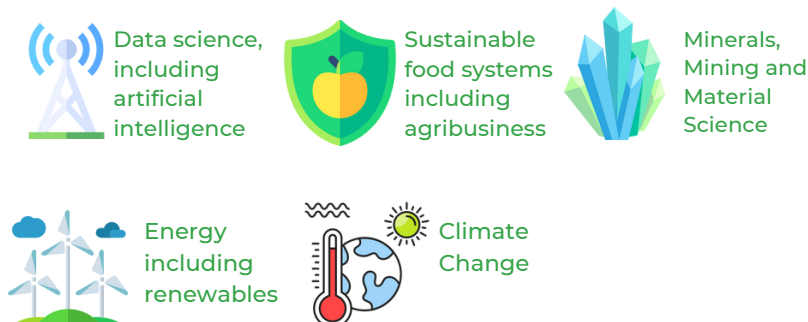
Science, technology, and innovation are key drivers in Ghana's transition to a sustainable economic model, with high prospects of value addition and diversification. In this regard, investing in human capital to develop a skilled workforce in sectors such as renewable energy, digital technologies, climate smart agriculture and agribusiness are critical for Ghana@100 as well as advancing the UN Sustainable Development Goals 2030. Such a skilled workforce comprising of world-class scientists would strengthen the labour market and improve value chains for sustainable businesses, enhancing opportunities for high quality jobs and improved livelihoods.

Contribution to PASET-Rsif

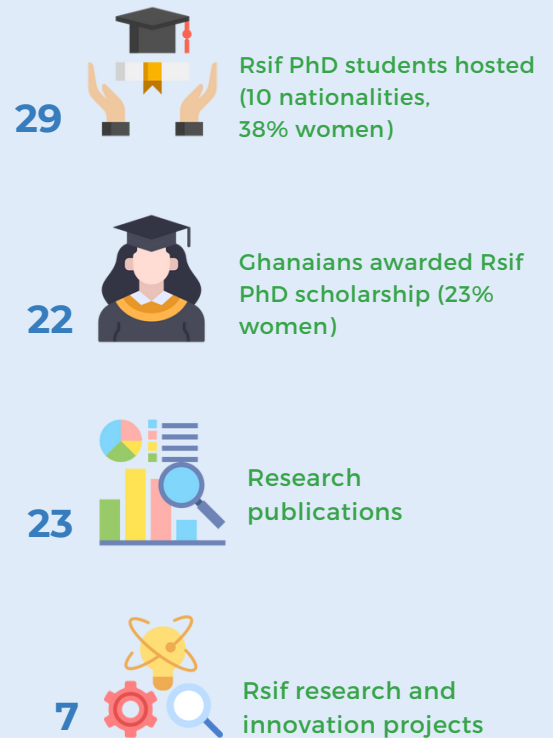
Ghana is one of the nine African countries that is contributing to the Regional Scholarship and Innovation Fund (Rsif) of the Partnership for skills in Applied Sciences, Engineering and Technology (PASET) since 2019 (Figure 1). Its committed contribution is USD 2 million to train Ghanaian PhD students in selected African host universities and collaborating with international partner institutions.

Through PASET-Rsif, Ghana will build strong institutions and future science leaders to drive a science and technology-led growth and development.

Rsif thematic areas



Rsif in Ghana at a glance



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.

Strengthening research and innovation capacity in Ghana

The University of Ghana (UG) is one of the 15 Rsif African Host Universities (*Figure 2*). The School of Agriculture, PhD Program in Applied Agricultural and Policy/Agribusiness hosts 29 Rsif funded PhD students (38% women, 10 nationalities). UG faculty are leading three Rsif research and innovation projects on a) design thinking for agricultural practitioners, b) urban street food safety, and c) enhancing the agri-innovation ecosystem at UG.

UG benefits 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*). Rsif also provided video-conferencing equipment, facilities for e-learning and access to a wide range of scientific journals to the library and its students.

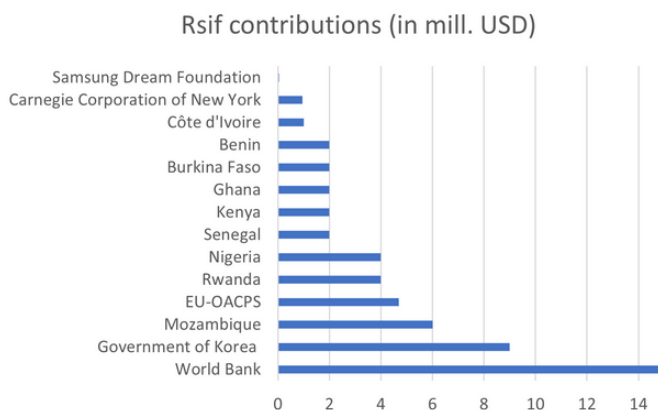


Figure 1: Rsif Contributing Countries and Partners

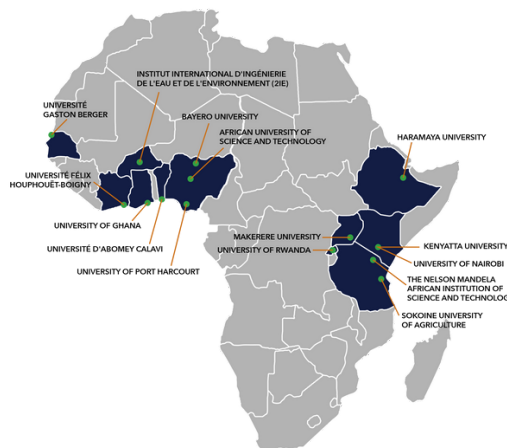


Figure 2: Rsif African Host Universities

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.

Spotlight on Ghanaian Rsif Scholars

Robust and Affordable Smart Agri-IoT Technology



Winner of an Rsif Junior Investigator Research Award (USD 80,000)

“The experiences and opportunities offered to me as an early career researcher, through Rsif are countless. As a Principal Investigator of the Agri IoT project, I learnt how to write grant proposals, assemble a research team, plan and execute activities, financial and project monitoring and how to mentor and supervise PhD students.

At present, the Department of Computer Science and Engineering at UMaT has appointed me to train and mentor other faculty on grantsmanship. The early results of this project have raised my profile as an early career researcher at my university.

Dr Emmanuel Effah, Ghanaian. Lecturer, Computer science and Engineering, University of Mines and Technology, Tarkwa, Ghana

First Ghanaian Rsif alumni. PhD in Computer Science from University of Gaston Berger, Senegal. Research placement at the Worcester Polytechnic Institute, USA.

Research area: Robust and Affordable Smart Agri-IoT Technology

The Agri-IOT project was officially launched at UMaT with presence of the Vice Chancellor and media. The university has allocated and refurbished a dedicated lab, which will be equipped through the grant.

The university also co-sponsored Dr Effah and 2 PhD students to attend a training on LoRa software at the Université Gaston Berger, Senegal, a project partner.

Dr Effah has so far submitted 3 manuscripts for review. “A Tutorial on Agricultural IoT: Fundamental Concepts, Architectures, Routing, and Optimization” was published by IoT-MDPI.

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

Wastewater treatment



Jonas Bayuo

Rsif PhD student at the Nelson Mandela African Institution of Science and Technology in Tanzania. Research placement at Institute of Green Bio Science & Technology – Seoul National University in Korea

Research area: Optimization of arsenic (III) and mercury (II) removal from mono- and binary biosorption systems onto hybrid activated carbon
9 publications

Carbon capture



Gloria Adjei

Rsif PhD student at University of Port Harcourt, Nigeria.

Research placement at Korea Institute of Energy Research (TBC)

Research area: Carbon dioxide capture using calcium-based biowaste

Commercializing agri-technologies



Rosalyne Naa Norkor Baddoo

Rsif PhD student at University of Ghana.

Research placement at Institute of Green-Bio Science & Technology, Seoul National University, Korea.

Research area: Commercializing Agri-Technologies from Ghanaian Research Institutions

Solar energy



Afia Owusuah Akyaw

Rsif PhD student at Kenyatta University, Kenya. Research placement at Korea Institute of Science and Technology (KIST), Korea.

Research area: Analysis of thermal and chemical stability of CsPbI₃ perovskite photovoltaic material synthesized under different conditions.

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.

Digital innovations enhance sustainable agricultural production and market access for agribusinesses in Ghana



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

There are seven Rsif funded research and innovation projects in Ghana. Three of these are part of the Accelerating Inclusive Green Growth through Agri-based Digital Innovation in West Africa (AGriDI) initiative, financed by the European Union through the ACP Innovation Fund. AGriDI aims to create a conducive environment for agri-based digital innovations, especially for women and youth farmers, and accelerating inclusive green growth.



Agrocenta trained 2,000 farmers in organic farming practices and utilization of organic farm inputs

An example is the Driving Market Access and Managing AG value chains (DigiMakt) which is being used to profile, and disseminate climate smart agronomic advisory, market information, weather alerts, insurance, and credit scoring for over 12,500 smallholder farmers for financial inclusion in Bono East and Oti regions.

DigiMakt was developed by Esoko Ltd., the winner of the Agri-Tech Company of the Year Award at the Ghana Agriculture and Agri-Business Awards 2023.

Another example of scaling market linkages is Agrocenta project. The Science and Technology Policy Research Institute of the Council for Scientific and Industrial Research (CSIR-STEPRI) is implementing a project 'Enhancing farmers' uptake of digital technologies through empirical research, innovation and policy intervention'.



University of Ghana partnered with Kosmos Innovation on KIC Agritech Challenge Classic 2023

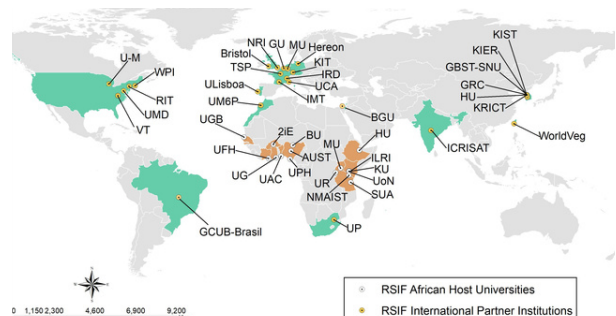


Figure 3: Rsif International Partner Institutions



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