



GHANA

Country Report 2021



Summary of RSIF in Ghana

21

Ghanaian RSIF
doctoral scholars
enrolled

25

PhD scholars and
faculty trained

14

Trainings
held

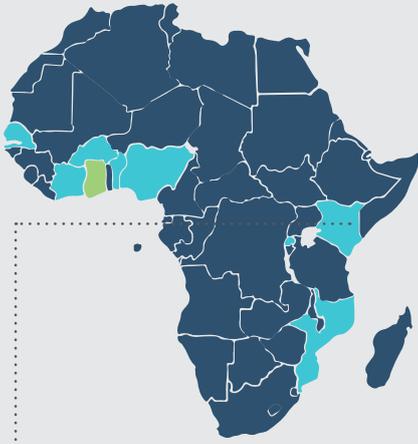
The **PASET** Regional Scholarship
and Innovation Fund



PASET

Partnership for Skills
in Applied Sciences,
Engineering & Technology

An Africa-led initiative to bridge the skills gap in Applied Sciences, Engineering, & Technology



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RSIF IS THE FIRST PAN-AFRICAN SCIENCE FUND OF ITS KIND

Contributing countries: Benin, Burkina Faso, Côte d'Ivoire, Ghana, Kenya, Mozambique, Nigeria, Rwanda and Senegal have made or are at the final stages of making contributions to PASET RSIF, in addition to the Government of Korea, the ACP Innovation Fund of the European Union and the World Bank.

RSIF is the first Pan-African Science fund of its kind connecting innovative minds to resources for revolutionary solutions.

It is the flagship product of PASET, an initiative led by African governments aimed at building skills of citizens of sub-Saharan Africa countries in the field of applied sciences, engineering, and technology for national economic growth on the continent. RSIF builds sustainable doctoral training, highly advanced research and innovation ecosystems to develop transformative technologies in Africa for economic growth and development.



At least 40% of the beneficiaries are women and priority is given to young faculty without a PhD.

Ghana's contribution to RSIF

Ghana became a member of PASET in 2019 and it hosted the PASET Governing Council (GC) meeting in December 2019. The Minister of Education represents Ghana in the PASET GC, and the Executive Secretary, National Council for Tertiary Education (NCTE), sits in the PASET Executive Board (EB).

Ghana has made an initial US\$2 million contribution to RSIF. 80% of Ghana's contribution directly supports training of Ghanaian scholars and is currently committed to enrolled students in the RSIF PhD scholarship programme. The potential of Ghana's innovative expansion due to this investment is multiplied when leveraged by the funds through matching support from various donors, including the Government of Korea, international partner institutions and others.

By being part of RSIF, Ghana benefits from joint resource mobilization with other countries and capacity building for PhDs and research and innovation far into the future. PASET aims to mobilise over USD 500 million into the RSIF endowment fund, with an estimated 20% to be allocated to research and innovation projects for the benefit of citizens and institutions of participating countries. Many African countries are interested to be part of this.

RSIF competitively selects and harnesses the brightest minds with:

(i) doctoral scholarships at Host Universities in Africa and 'sandwich' training at selected International Partner Organizations, (ii) research awards, and (iii) innovation awards to faculty of graduated RSIF scholars.

PASET members have prioritized five cutting-edge thematic areas that will drive growth on the continent:



ICTs including big data & artificial intelligence



Minerals, mining & materials engineering



Energy including renewables



Food security & agribusiness



Climate change

BENEFITS TO CONTRIBUTING GOVERNMENTS

As a contributor to RSIF, Ghana benefits in more ways than through the cost-effective training of its doctoral students.

Countries also benefit from efficient centralized administration of the scholarship and other grants, support for the RSIF scholars to ensure that they complete on time, as well as regular monitoring reports on the progress of their students. The pooling of funds, the highly competitive selection of host universities, international partners and students, and the efficient administration of the fund enhances the value and increases the benefits.

Ghana's participation in RSIF benefits the entire Ghanaian higher education, science and innovation ecosystem. All RSIF scholars will undergo high quality doctoral training in competitively selected SSA universities partnered with international universities, with study abroad for part of the time, at a fraction of the cost of sending students abroad for a full time PhD. On successful completion of the PhD, the students will be eligible for research and innovation grants.



Highly Skilled Human Capital as a Driver for Ghana@100

The rationale for RSIF is that Africa requires world class scientists in priority thematic disciplines that are relevant to national economic growth across sub-Saharan Africa. Some of these areas include orphaned research areas such as mining, minerals and materials science, energy and information and

communication technology among others. 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 for the future needs of the country.



Ghana's participation in RSIF is aligned with the Ghana @100 long-term development framework and the emphasis on science, technology and innovation as a driver for transformation.

Photo: Hon. Dr. Matthew Opoku Prempeh, then Minister of Education, Ghana, at the 5th PASET Forum in Kigali, May 2019.

NURTURING HIGH-IMPACT PARTNERSHIPS

and Strengthening Research and Innovation capacity of University of Ghana

Photo: RSIF PhD student training on the sidelines of the 5th PASET Forum in Kigali, Rwanda, May 2019.



In 2019, University of Ghana (UG) was competitively selected as an RSIF African Host University in the PASET priority thematic area of Food Security and Agribusiness. The selected PhD programme at UG is in Applied Agricultural Economics and Policy/ Agribusiness.

[UG is hosting 11 RSIF funded doctoral scholars \(of which eight Ghanaians\).](#)

Fourteen more Cohort 3 students will join this year. As an RSIF African Host University, UG benefits from various capacity building and technical support, such as strengthening internationalization and accreditation.

UG benefits from linkages with other RSIF AHUs as well as with RSIF international partner institutions for the RSIF's 'sandwich programme' - whereby students spend 6-24 months at an advanced institution conducting collaborative research.

RSIF has supported the establishment of research networks to support UG. For example, faculty members participated in a study visit to Mohamed 6 Polytechnic (UM6P), Morocco in September 2019 to identify areas for research collaboration and student sandwich training along with ten other universities.

Photo: RSIF host university agreement between UG and *icipe*, the Regional Coordination Unit for RSIF, was signed in Nairobi, Kenya in presence of the PASET Governing Council and the Executive Director of the PASET Executive Board on the 7 October 2019. [Read more](#)



Photo: Four faculty members from Ghana, from UG and from Kumasi Technical University, participated in the RSIF grant writing training at *icipe*, Nairobi, Kenya in January 2020.



UG has received video-conferencing equipment and related facilities to enhance e-learning, particularly as a response to the pandemic. RSIF is also providing increased access to a wide range of scientific journal resources to UG library and its students.

To help universities respond to COVID-19, *icipe* has provided two training workshops on 'The use of Online Educational Resources in Higher Education' and on 'Online Educational Resources as a Response to the COVID-19 Crisis' co-organized by EPFL (Switzerland) and University Mohammed VI UM6P (Morocco). A training was also done on 'Helping Faculty Deliver their Courses Online during the COVID-19 Crisis' with the Director of Digital Innovation at Arizona State University.

Strengthening university innovation and delivery of personal protective equipments (PPEs) – eight session training were provided by Worcester Polytechnic Institute (WPI), Boston, USA on COVID-19 and 3D printer assembly as well as printing of face masks, face shields and respirator. Universities were able to learn practically how to print various PPEs and supplied these to hospitals and to the public.

RSIF Training Courses Provided:

1. Research Communications and social media
2. Digital Storytelling
3. Reference management & open access
4. Grant writing
5. E-Resources
6. Grievance address mechanisms
7. Sexual harassment
8. Strategies for a successful PhD
9. PhD proposal writing
10. Responsible conduct of research including research ethics
11. Introduction to information literacy
12. Introduction to research methods and statistics, data analysis and management
13. Science presentations
14. Science posters

Training Applied Researchers in Science and Engineering Fields

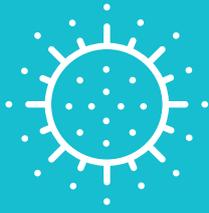
RSIF has awarded scholarships to more than 180 RSIF PhD scholars in total from across sub-Saharan Africa. 21 of these are Ghanaians. More scholars will be selected in Cohort 4 in late 2021.

The Ghanaian RSIF graduates are equipped with advancing technologies and strategic research skills for innovation solutions. This provides opportunities for building new university departments that respond directly to national priorities, boosting Ghana's capacity to train at the PhD and postdoctoral level. With the ability to undertake high quality research, Ghana will be well positioned to lead improved outputs, ranking and prestige.

Breaking Barriers for Women in Science

Women's participation in research remains low in Africa, with women making up only 30% of the science community.

19% (four of 21) of the Ghanaian RSIF PhD scholars in the three first cohorts are female. RSIF assigns attention to not only women, but also, underrepresented groups, seeking to promote family-friendly policies as well as language and accessibility measures.



RESILIENCE OF RSIF SCHOLARS: COVID-19 CHALLENGES AND LESSONS LEARNT

In a [published article](#), three female RSIF PhD scholars on international sandwich placements in Korea and USA, discuss the impact of COVID-19 pandemic on their personal lives and research journeys. Their immense resilience to pursue despite the unprecedented challenges is evidence of the determination and caliber of RSIF scholars. While the COVID-19 pandemic is affecting all scientists in general, women scientists, especially those with young families, are uniquely impacted. RSIF not only ensures that women scientists enter and thrive in PhD programmes, but also, guarantees that all its scholars are able to circumvent the challenges related to the pandemic. *icipe*, RSIF's RCU is already providing support to scholars in various ways, including online training support, and psychosocial support on issues like mental health. In addition, RSIF is working with partner universities and students towards timely progression in research and overall course completion.

<https://www.universityworldnews.com/post.php?story=20201208123315401>

CATALYZING RESEARCH

to Generate Transformative
Technologies for Innovation
and Development

Faculty members engaged in PhD training at UG are eligible to apply for RSIF Research and Innovation Awards. These competitive grants enable faculty members to advance their research and to help their PhD students generate exceptional research results to solve pressing African challenges.

See repository of RSIF Scholar Research [here](#)

Innovation spurs from collaborative knowledge sharing.

RSIF's establishment of international networks provides UG with a global pool of like-minded innovators.

RSIF provides research and innovation funding for staff at UG. Currently funded, are two active projects that bridge the gap between scientific research and practical innovative solutions. RSIF is encouraging partnership with international partners and private firms to leverage some of the brightest minds on the continent. This will contribute to enhanced partnership in higher education, science and innovation ecosystem and collaboration in training, research and innovation.

In addition, Ghanaian institutions are eligible to compete for grants in the area of Agri-based digital innovations under the ACP Innovation fund for Western Africa that *icipe* is also managing.



RSIF INNOVATION PROJECT:

Photo: Prof. Irene Egyir, UG

Enhancing the University of Ghana Agri-Innovation Ecosystem

Project Title: Institutional framework to enhance the agri-innovation ecosystem within the University of Ghana (IFEA-Eco)

Project leader: [Prof. Irene S. Egyir, UG](#)

Collaborating partners:

1. RMG Ghana Ltd., Ghana
2. Agri-Impact Consult, Ghana
3. Alliance for a Green Revolution in Africa (AGRA), Ghana
4. Council for Scientific and Industrial Research (CSIR), Ghana

This project seeks to work with strategic partners in the private sector and international community as well as Government's research institutes and the Department of Agricultural Economics and Agribusiness of the University of Ghana to support the existing Technology Transfer Office in the University to raise funds and conduct market research for the introduction and scale up of new agri-products, study of market opportunities and identify factors to stimulate new product demand.

The project will support the University to update relevant policy documents related to innovation development, Intellectual Property production and technology transfer. It will also support capacity building of faculty and students on IP protection and Agricultural technology transfer processes to create a conducive environment for university-agro-industry partnerships. [Read more](#)

Piloting a Design Thinking Development Centre (DTDC) at the University of Ghana

RSIF RESEARCH PROJECT:

Project Title: Building resilient agribusiness practitioners through design thinking approach

Project leader: [Prof. Irene S. Egyir, UG](#)

Collaborating partners:

1. RMG Ghana Ltd., Ghana
2. Alliance for Green Revolution (AGRA), Ghana
3. Agri-Impact Consult, Ghana

The project aims to set up and pilot a Design Thinking Development Centre (DTDC) at the Department of Agricultural Economics and Agribusiness at the University of Ghana. A three-year randomized control trial (RCT) experiment to identify the impact of three design thinking aspects (empathy, intuition and experimentation) will be set up among a heterogeneous sample of graduate students from the School of Agriculture, with long-term career goals, such as providing business development services, policy support services, product development and entrepreneurship. The RCT will reveal how heterogeneity in agribusiness scale, market integration, and agricultural labor market participation affects demand for the three aspects of design thinking.

The establishment of the Design Thinking Development Centre at the university is a sustainable approach towards developing resilient agribusiness graduates for the sector.

[Read more](#)

| Name | Research Topic | African Host University |
|--------------------------------|--|--|
| Afia Owusuah Akyaw | Fabrication of efficient monolithic all-perovskite tandem solar cells | Kenyatta University (KU), Kenya |
| Jonas Bayuo | Adsorption-desorption of heavy metals and regeneration of the exhausted adsorbents | Nelson Mandela African Institution of Science and Technology (NM-AIST), Tanzania |
| Emmanuel Effah | Implementation of new fault tolerance solutions in a wireless sensor network in a multi-channel context | University of Gaston Berger, Senegal, Africa Centre of Excellence for Mathematics, Informatics and ICT (MITIC) |
| Harry Bleppony | Examining the effect of firm characteristics on performance and survival of agricultural non- traditional export firms in Ghana | University of Ghana (UG) |
| Benjamin Sarfo | Adaptive capacity and mitigation strategies against climate change implications on food security. smallholder farmers perspective, Ghana | |
| Esther Aba Eshun | Food and nutritional security status and gender integration: A case study of female-headed households in selected districts of northern savanna ecological zone (nsez) | |
| Saani Nassam Iddrisu | Enhancing food security through mushroom production and value addition in Greater Accra, Ghana | |
| Nana Okyir Baidoo | Social impact analysis of private sector investments in the Ghanaian cocoa sector | |
| Motin Bashiru | Vulnerability of smallholders to farm investment risks: emerging strategies and farmers' response for sustainable farm enterprises in northern Ghana | |
| Rosalyn Naa Norkor Baddoo | Livelihood and food security status of rice value chain actors in the Volta and North East regions of Ghana | |
| Benjamin Musah Abu | A quadruple-hurdle model of production and market participation of farm households in Ghana | |
| Nana Anima Mary Akrofi | Enhancing rural sustainable farming and food security of small holder farmers in Northern Ghana | |
| Collins Ebenezer Appiah | Traffic air pollution and its impact on roadside vendors; a case study in Kintampo-North municipality | |
| George Akrong Morton | Impact of participation in innovation platform on productivity and commercialization of rice-producers in Northern Ghana | |
| Frederick Ziinbalang Puozaa | Agricultural market volatility and food security in sub-Saharan Africa | |
| Cuthbert Kaba Nabilse | Pathways for sustainable transition of Ghana's food system | |
| Safianu Omar | An IoT-based decision support system for small-scale farming | |
| Promise Ricardo Agbedanu | Self learning anomaly detection system for Internet of Things | |
| Destiny Kwabla Amenyedzi | Use of smartphones in teaching ICT and pupils' skills achievement in Ghana basic schools | |
| Martin Ansong | Technical assessment and environmental impacts of renewable energy and electric vehicles in Ghana | University of Nairobi, Kenya |

SPOTLIGHT ON AFRICA'S FUTURE LEADERS

in Science, Engineering
and Technology



RSIF PhD scholar Emmanuel
EFFAH – University Gaston
Berger (UGB), Senegal and
sandwich programme
at Worcester Polytechnic
Institute, Boston, USA.



Photo: RSIF PhD Scholar
Emmanuel Effah at the Poster
Exhibition, 5th PASET forum in
Kigali, Rwanda, May 2019

Emmanuel's PhD research aims to build a robust and affordable Smart Agri-IoT (Agricultural-Internet-of-Things) technology from theoretical modelling to real-world implementation to address the challenges climate change and the skyrocketing global population have meted on food security in Sub-Saharan Africa (SSA).

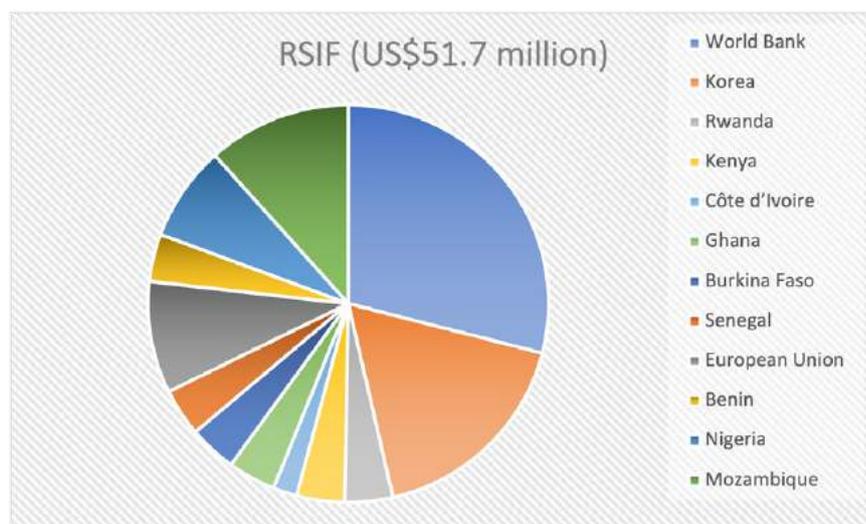
He is faculty at UMaT, Ghana with over 20 publications in reputable peer-reviewed journals and conferences, of which five emerged from his current ongoing PhD research.

In line with Ghana's declared national digitization agenda in 2016 which hinges on strengthening technical expertise in IoT-based or smart systems technology, UMaT opted to become a center of leadership in this area in the region. This called for a thorough IoT-based Ph.D. program that bridges the current technical gaps between the theoretical philosophies and practice of IoT-based smart technology in the context of SSA with relevant trained human power to support the running of the program. I was also looking to do a PhD in this area. Secondly, the PASET-RSIF scholarship came when all faculty members without PhDs had been given an ultimatum to obtain one or else lose their jobs. Consequently, this noble scholarship did not only salvage my career dreams but also contributes to Ghana's vision of building world class IoT-based capacities to drive her smart/digitization agenda.

“As a faculty member of UMaT, Ghana on study leave, my vision post-PhD is to return home and contribute my honest part in terms of teaching, research and services to my country, Africa and the global community in the area of building Smart Systems Technology for Africa’s digital transformation.”

[Read more](#)

THE FIRST PAN- AFRICAN SCIENCE FUND INTUITIVELY DESIGNED FOR GROWTH



RSIF is designed for sustainability and has two components: (i) the General Fund and (ii) the Permanent or Endowment Fund, with proceeds to capitalize the general fund.

Country contributions have been earmarked to scholarships, and in some cases to support research and innovation projects, aligned with national needs. So far, most countries have focused on doctoral training.

More importantly, RSIF aims to create a permanent vehicle for supporting science, technology and innovation capacity building through an endowment fund that is being established by the governments.

Ghana is encouraged to continue its leading role in PASET through continued contribution to RSIF and investment in the RSIF endowment fund for lasting returns.

Ghana is a country gaining immense traction that can be used to explore innovative ways of raising more funds for RSIF. By providing tax incentives for private sector companies investing in RSIF, by recommending RSIF to its development partners and by making a fixed annual budgetary allocation to RSIF, Ghana will be in alignment with its commitment to PASET's vision.



Photo: RSIF
cohort 1 scholars

I see Africa as the hope of the world.

**I am so proud to be an African solving
problems that pertain to Africa.**

**And to be part of this very strong team
organized by PASET.**

**On behalf of the students we want to
promise that the investment in us will
never go to waste.**

**Trust us. We will never disgrace PASET
and the vision for Africa.**

RSIF PhD Student Emmanuel Effah, Ghana

[Video link](#)

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Please contact the RSIF-RCU at *icipe*
for further details.

PASET Regional Scholarship and
Innovation Fund (RSIF), Regional
Coordination Unit (RCU)

The International Centre of Insect
Physiology and Ecology (*icipe*),
Duduville Campus, Kasarani

P.O. Box 30772-00100, Nairobi, Kenya



+254 20 863000



dg@icipe.org

icipe@icipe.org



Rsif@icipe.org



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