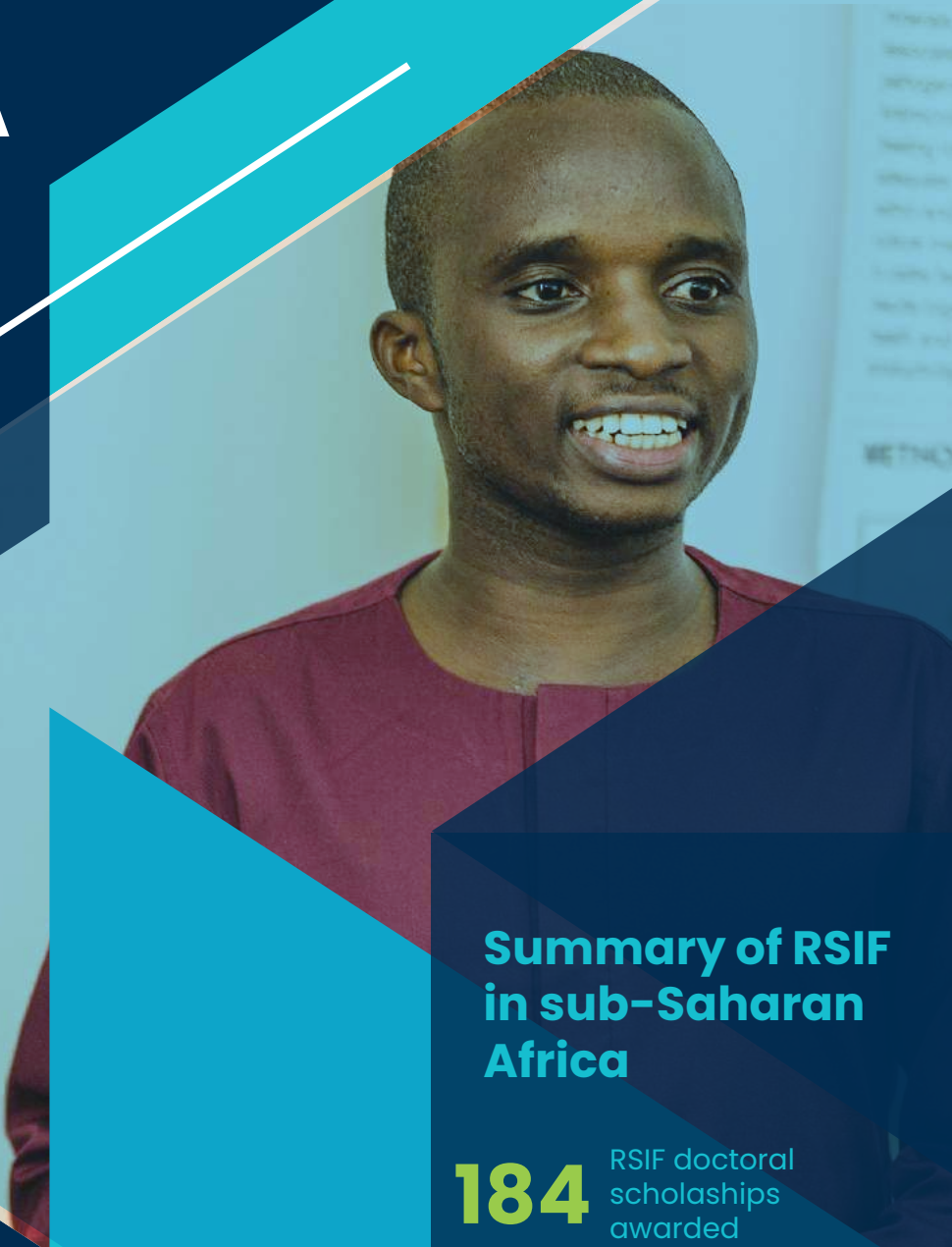




# PAN-AFRICA

Progress Report 2021



## Summary of RSIF in sub-Saharan Africa

**184** RSIF doctoral scholarships awarded

**21** sub-Saharan African scholar nationalities

**15** African Host Universities

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*



# PAN-AFRICA

Progress Report 2021

## 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.

### African Government Contributions to RSIF

Launched by H.E. President Macky Sall of Senegal in 2015 together with representatives of the Heads of States in Ethiopia and Rwanda, RSIF is unique in being an African government-led science fund for Africa. Kenya and Rwanda were the first African countries to make their financial contributions to RSIF in 2018. More governments have since joined: Côte d'Ivoire, Burkina Faso, Senegal, Ghana, Benin and Mozambique. Funds from Nigeria are expected soon.

Ministers of countries that have contributed an initial USD 2 million to RSIF sits in the PASET Governing Council (GC), while their representatives meet in the PASET Executive Board (EB). Kenya's Cabinet Secretary of Education is the current chair. As agreed by PASET members, 80% of an African government's financial contribution to RSIF directly supports their nationals. The potential of African countries' innovative expansion due to investment in RSIF is multiplied when leveraged by the funds through matching support from various donors, including the Government of Korea, international partner institutions and others.

By contributing to RSIF, African governments benefit 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 permanent 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 contributors to RSIF, African governments benefit 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.

African countries' participation in RSIF benefits their entire 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 the African Union Agenda 2063 and National Development Plans

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 continent and the participating countries.





# NURTURING HIGH-IMPACT PARTNERSHIPS

and Strengthening Research and Innovation capacity at selected African universities

Photo: Training of postgraduate students in nanopore next-generation sequencing at Sokoine University of Agriculture.



Integral in the RSIF model and design is increasing the institutional capacities of selected African universities and their wider innovation systems to ensure sustainability and strengthen Africa's positioning.

This promises further multiplier effects and reduced PhD costs over time, required to substantially increase the stock of highly skilled scientists, professionals and innovators for transformation to a knowledge economy.

The [RSIF African Host Universities \(AHUs\)](#) are competitively selected universities in SSA that offer a PhD program in one of the PASET Priority Thematic Areas. RSIF AHUs admit and train RSIF PhD scholars.

As dedicated RSIF African Host Universities, they benefit from various capacity building and technical support, such as strengthening internationalization and accreditation.

They benefit from linkages with other RSIF AHUs as well as with RSIF international partner institutions for 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 the universities. For example, faculty members participated in a study visit to Mohamed VI Polytechnic (UM6P), Morocco in September 2019 to identify areas for research collaboration and student sandwich training.

Photo: RSIF host university agreement between the first ten AHUs 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: 35 faculty members from AHUs and their partners benefited from RSIF grant writing training at *icipe*, in January 2020.



RSIF AHUs 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 the AHU libraries 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 and Building Research

The RSIF programme has supported more than 180 students from 21 different Sub-Saharan African nationalities. More scholars will be selected in Cohort 4 in late 2021.

The 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 continental and national priorities, boosting capacity to train at the PhD and postdoctoral level. With the ability to undertake high quality research, participating African countries 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. RSIF is shifting that perspective.**

39% of the RSIF PhD scholars in the 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.

[Video link](#)



# 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

## Innovation spurs from collaborative knowledge sharing.

Faculty members engaged in PhD training at RSIF African Host Universities and graduates 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.

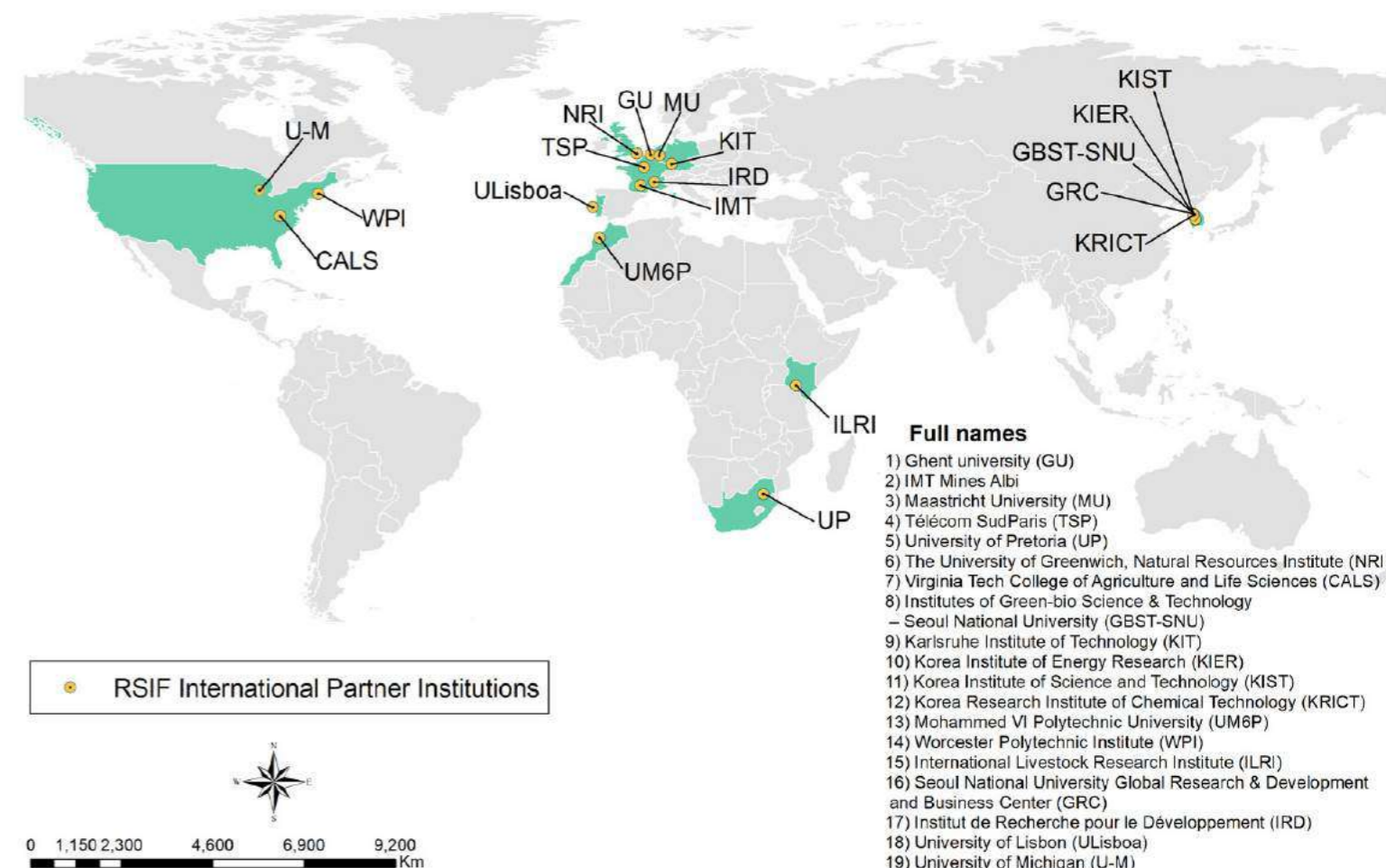
Currently funded are [fourteen projects](#) that bridge the gap between scientific research and practical innovative solutions.

See the project leaders [here](#).

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

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.

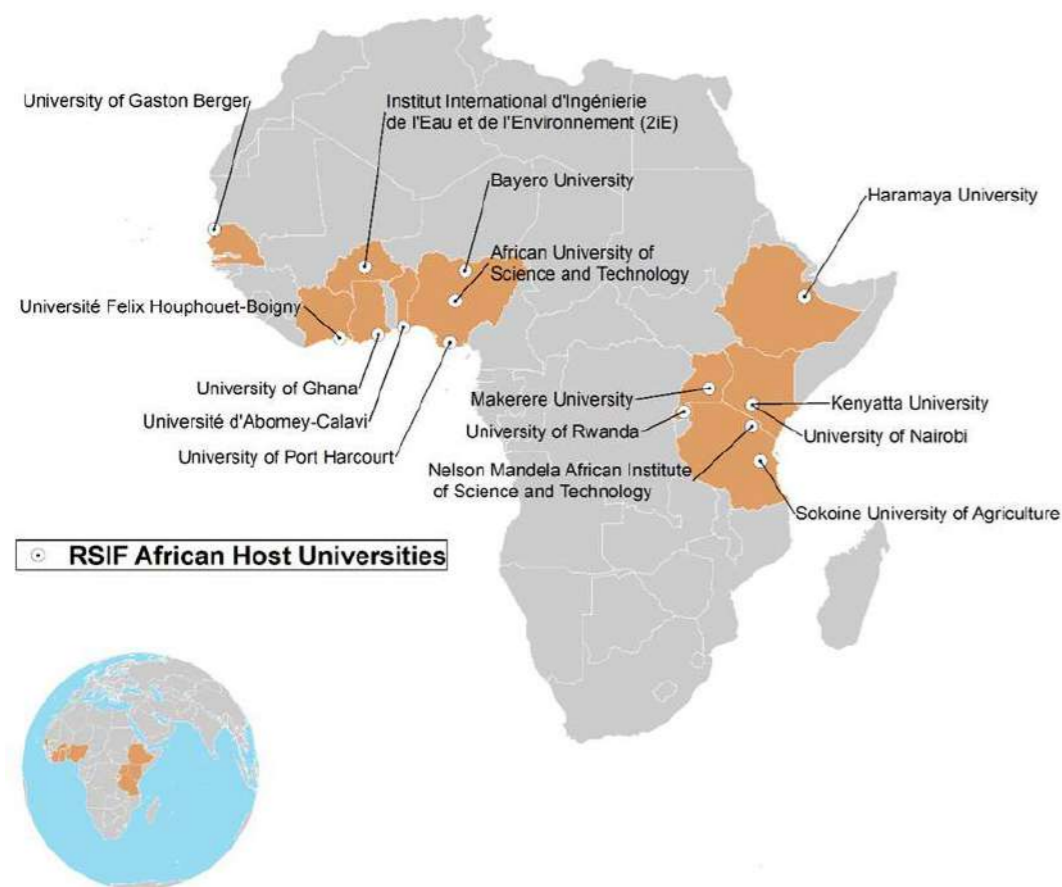


**Through PASET RSIF the cost of PhD training is significantly lowered,** while also reducing inbreeding in national universities since PhD training will be done in other African universities and international partner institutions.

**By working closely with academic institutions, relevant investors and governments and other stakeholders within sub-Saharan Africa; specialized knowledge will be integrated in the region and transferred to the future generation.**

# SPOTLIGHT ON AFRICA'S FUTURE LEADERS

in Science, Engineering and Technology



RSIF focuses on transformative technologies that have a far-reaching positive impact on society.

It supports PhD students, post-doctoral scientists and universities in SSA to establish high quality training, research and innovation environments and to develop institutional capacity for the benefit of the whole region.

## ICTs including Big Data and Artificial Intelligence

This involves the use of information and communication technologies in a wide range of economic sectors, including big data analytics and artificial intelligence systems, computer programming, software development and their applications in manufacturing and service delivery.

RSIF African Host Universities	PhD Programs
<b>University of Gaston Berger</b> , St. Louis, Senegal Africa Centre of Excellence in Mathematics, Computer Science, and ICT (MITIC)	Computer Science
<b>University of Rwanda</b> , Kigali, Rwanda Africa Center of Excellence in Internet of Things (ACEIoT)	Internet of Things: Embedded Computing Systems
<b>Université d'Abomey-Calavi</b> , Abomey-Calavi, Benin Centre d'Excellence des Sciences Mathématiques, Informatique et Applications (SMIA)	Technologies de l'Information et de la Communication de l'Institut de Mathématiques et de Sciences Physiques



**Meet Barbara Kabwigia Asingwire.** An RSIF PhD student at University of Rwanda, Africa Centre of Excellence in Internet of Things (ACEIoT)

[Video link](#)

**My research is on use of Internet of Things (IoT) technologies to improve health care services; minimizing delays in response to time-sensitive conditions.**

**Using Artificial Intelligence to transform agriculture in Africa.** Fatoumata Thiam (from Senegal) talks about her groundbreaking research that assesses energy efficiency in irrigation networks. [Read more](#)



### RSIF Research and Innovation Projects:

- Real time Assessment of the indoor air pollution in Sub-Saharan households (Case study: Rwanda rural and urban areas). [Link](#)
- Smart Bee Hiving Technology. [Link](#)

[RSIF Scholars' Publications link](#)



## Food Security and Agribusiness

This includes sustainable food production systems, pest and disease control strategies, management of post-harvest losses of crops and new opportunities for agribusiness development. Other areas include new ways to improve soil fertility, conserve water for food and agricultural production, and enhancing nutrition for humans and livestock.

RSIF African Host Universities	PhD Programs
<b>Sokoine University of Agriculture</b> , Morogoro, Tanzania Africa Centre of Excellence for Infectious Diseases of Humans & Animals in Southern & Eastern Africa (SACIDS)	Food Security and Agribusiness
<b>University of Ghana</b> , Accra, Ghana	Applied Agricultural Economics and Policy/Agribusiness
<b>Makerere University</b> , Kampala, Uganda Makerere University Regional Centre for Crop Improvement (MaRCCI)	Plant Breeding and Biotechnology



**Meet Grace Wanjiku Gachara.** An RSIF PhD scholar at Sokoine University of Agriculture, SACIDS, Tanzania.

[Video link](#)

I am really passionate about using science to solve problems. My research is on the maize problem of aflatoxin and post-harvest issues that affect millions and millions of farmers.

### What's in an African cabbage? A lot, says researcher.

Sylvia Wairimu Maina (from Kenya) talks about her doctoral research on the nutritional benefits of the African cabbage.

[Read more](#)

I will contribute to the fight against infectious diseases in Africa. [Link](#)

I am on a mission to improve cowpea breeding in Africa. [Link](#)



### RSIF Research and Innovation Projects:

- Building Resilient Agribusiness Practitioners through Design Thinking Approach. [Link](#)
- Institutional framework to enhance the Agri-innovation ecosystem within the University of Ghana (IFEA-Eco). [Link](#)
- Innovative Biosystems for Self-sufficiency in Molecular Biology Reagents in Africa. [Link](#)

[RSIF Scholars' Publications Link](#)

## Minerals, Mining and Materials Engineering

This includes mineral processing and beneficiation, mining and materials engineering. Other important areas include new materials for construction, transportation, consumer goods, health care delivery and production equipment. Work involving nanomaterials and exploring novel biomaterials and related climate-smart materials is of much interest as well.

RSIF African Host Universities	PhD Programs
<b>Nelson Mandela African Institution of Science and Technology (NM-AIST)</b> , Arusha, Tanzania Africa Centre of Excellence: Water Infrastructure and Sustainable Energy Futures (WISE – Futures)	Materials Science and Engineering
<b>Kenyatta University</b> , Nairobi, Kenya	Materials Science
<b>African University of Science and Technology</b> , Abuja Nigeria Africa Centre of Excellence: The Pan Materials Institute (PAMI)	Mining and Materials Processing Engineering



**Meet Richard Kipyegon Koech.** An RSIF PhD scholar at the African University of Science and Technology (AUST), Nigeria.

His dream is to mentor young scientists. [Read more](#)

As a youngster, I was intrigued by the idea that most concepts learned in science are practical in nature and have real-life applications. I saw science as a way of finding solutions to most problems in society.

**Meet Jeanne Pauline Munganyinka.** An RSIF PhD scholar at African University of Science and Technology (AUST), Nigeria with sandwich programme at Worcester Polytechnic Institute, USA, who plans to shake up the gold mining across the continent by developing an environmentally friendly alternative to the widely used toxic methods of extracting gold. [Read more](#)

Nicknamed "Professeur" by my peers, I was inspired to pursue a PhD. [Link](#)

### RSIF Research and Innovation Projects:

- Fluoride removal from drinking water using capacitive deionization. [Link](#)
- Solar-assisted heat pump dryer with energy storage for drying biomaterials. [Link](#)
- From Research to Markets: Strengthening the Innovation Capacity of AUSTInspire. [Link](#)

[RSIF Scholars' Publications Link](#)





## Energy including Renewables

This involves new forms of energy as well as more efficient ways of using energy. Developing renewable energy sources, e.g. biomass, wind, solar, and geothermal is highly encouraged.

RSIF African Host Universities	PhD Programs
<b>University of Gaston Berger</b> , St. Louis, Senegal Africa Centre of Excellence in Mathematics, Computer Science, and ICT (MITIC)	Petroleum and Gas Engineering / Energy Economics
<b>University of Nairobi</b> , Nairobi, Kenya	Physics
<b>Institut International d'Ingénierie de l'Eau et de l'Environnement (2iE)</b> , Ouagadougou, Burkina Faso Centre d'Excellence pour la Formation et la Recherche en Sciences et Technologies de l'Eau et l'Environnement en Afrique de l'Ouest et du Centre (CEA-IMPACT 2iE)	Sciences et Technologies de l'Eau, l'Energie et l'Environnement



**Meet Jacinta Okwako.** An RSIF PhD scholar at University of Nairobi. [Video link](#)

My biggest dream is an Africa that has a 100% energy access rate. We need to improve this to grow our economy.

- **Meet Kay Nyaboe Nyakundi.** An RSIF PhD student at University of Nairobi, Kenya. [Video link](#)

We have an opportunity to nurture the young people to join us and offer solutions that are African-based for African problems

### RSIF Research and Innovation Projects:

- Research and development of photovoltaics based on lead-free perovskite solar cell technology. [Link](#)
- Capacity Building for University-Industry Business Technology Transfer. [Link](#)
- Strengthening Institutional Infrastructure for an Innovation Ecosystem. [Link](#)

**RSIF Scholars' Publications** [Link](#)



## Climate Change

This involves developing strategies for mitigating or adapting to climate change, including, for example, early warning systems for natural disasters and strategies for disaster management, modelling for climate change, and building climate smart or resilient systems for urban and rural communities and disaster-prone populations in Africa.

RSIF African Host Universities	PhD Programs
<b>University Felix Houphouet-Boigny</b> , Abidjan, Côte d'Ivoire Africa Centre of Excellence for Climate Change, Biodiversity and Agriculture (CEA-CCBAD)	Climate Change and Biodiversity
<b>Bayero University</b> , Kano, Nigeria Africa Centre of Excellence in Dryland Agriculture (CDA)	Natural Resources Management and Climate Change
<b>Haramaya University</b> , Dire Dawa, Ethiopia Africa Center of Excellence for Climate Smart Agriculture and Biodiversity Conservation (ACE Climate SABC)	Climate Smart Agriculture and Biodiversity Conservation



**Meet Fenet Belay Daba.** An RSIF PhD scholar at Bayero University Kano, Nigeria. [Video link](#)

Through my RSIF PhD research, I will be a problem solver for my country, serve the community and use this knowledge to teach students, because I am a lecturer at Jimma University in Ethiopia.

### Tackling one of Africa's greatest enemies – drought.

Susan Ojochide (from Nigeria) talks about her research that will help to alleviate food insecurity in semi-arid areas. [Read more](#)

Her Journey to the PhD: Petronille Dusingizimana. [Link](#)

### RSIF Research and Innovation Projects:

- Do-It-Yourself Adaptation: New Pathways for Community Flood Risk Communication . [Link](#)
- Initiatives for Sustainable Food Security Innovations in the Drylands. [Link](#)
- Sustainable and innovative production of yams in Côte d'Ivoire by post-harvest pest control. [Link](#)

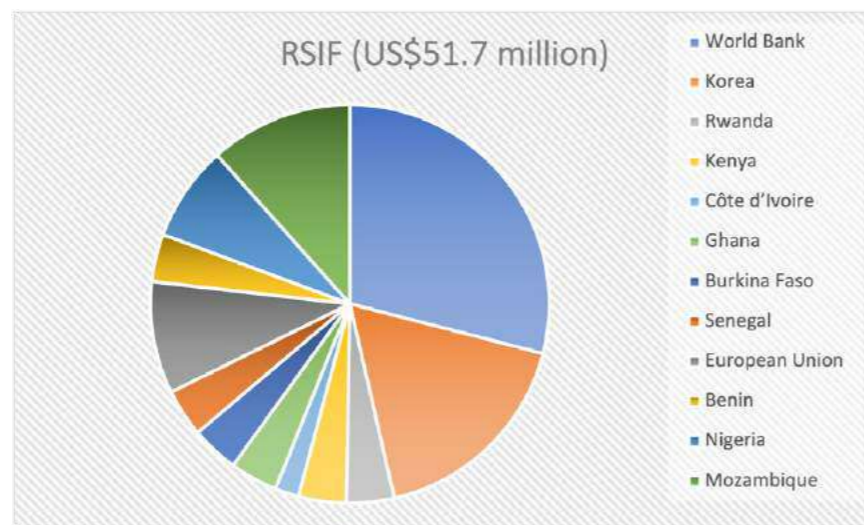
**"The project seeks to test the effectiveness of biopesticides as an alternative to chemical postharvest control for yam fungi."** Dr Camara, Project Leader, UFHB

**RSIF Scholars' Publications** [Link](#)





# 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 a permanent fund that is being established by the governments.

African governments are encouraged to join PASET through contributing to RSIF and investing in the RSIF permanent fund for lasting returns.

Governments can 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, governments will be in alignment with their commitment to PASET's vision.



H.E. the President of the Republic of Kenya, Uhuru Kenyatta, spoke about RSIF on the occasion of *icipe's* 50th anniversary, Nairobi, 20 November 2020. *icipe* is the RSIF Regional Coordination Unit. [Read more.](#)  
See video statement [here.](#)



African governments make good their pledges for advanced training in applied sciences and technology, as continental demand soars.

[Read more](#)

[Sign up to RSIF newsletter](#)

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The **PASET** Regional Scholarship  
and Innovation Fund



**PASET**  
Partnership for Skills  
in Applied Sciences,  
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*An Africa-led initiative to bridge the skills gap in Applied Sciences, Engineering, & Technology*

Regional Coordination Unit



**icipe**