



NIGERIA

Country Report 2021



Summary of RSIF in Nigeria

5

Nigerian RSIF doctoral scholars enrolled

35

PhD scholars and faculty trained

14

Trainings held

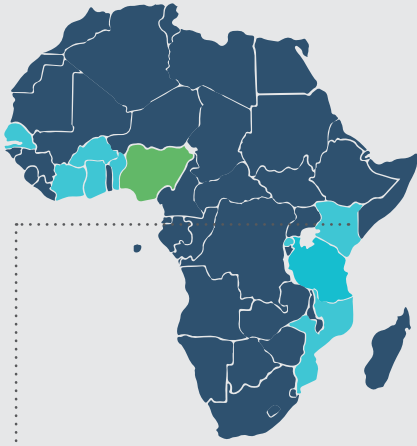
The **PASET** Regional Scholarship and Innovation Fund



PASET

Partnership for Skills in Applied Sciences, Engineering & Technology

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



NIGERIA

Country 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.

Nigeria's Contribution to RSIF

Nigeria has participated in several PASET Forums and events. Nigeria has pledged to contribute USD 4 million to RSIF. Once the agreement is signed, Nigeria will formally join the PASET governance bodies. 80% of Nigeria's contribution will directly support training of Nigerian scholars in the RSIF PhD scholarship programme.

The potential of Nigeria's 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, Nigeria will 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 a contributor to RSIF, Nigeria 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. Nigeria's participation in RSIF will benefit the entire Nigerian 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 Nigeria National Development Plan

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.



NURTURING HIGH-IMPACT PARTNERSHIPS

and Strengthening Research and Innovation Capacity at AUST, BUK and UniPort

Photo: Worcester Polytechnic Institute in Boston, USA, an RSIF international partner institution, is hosting the inaugural group of RSIF PhD scholars, which include students from the African University of Science and Technology (AUST), Nigeria.



Three Nigerian universities have been competitively selected by PASET as RSIF African Host Universities.

African University of Science and Technology (AUST), Africa Centre of Excellence: Pan-African Materials Institute (PAMI) is as an RSIF African Host University (AHU) in the PASET priority thematic area of Minerals, Mining and Materials Engineering since 2018. The selected PhD programme at AUST is in Material Science and Engineering.

Bayero University Kano (BUK), Africa Centre of Excellence in Dryland Agriculture (CDA) is an RSIF AHU in Climate Change since 2019. The selected PhD programme at BUK is in Natural Resource Management and Climate Change.

University of Port Harcourt (UniPort), African Center of Excellence in Oilfield Chemicals Research (ACE-CEFOR) is an RSIF AHU in Energy including renewables since 2019. The selected PhD programme at UniPort is in Petroleum and Gas Engineering / Energy Economics.

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

AUST, BUK and UniPort benefit 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.

Photo: RSIF host university agreement between AUST, BUK, UniPort 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: Nine Nigerian faculty members from AUST, BUK and UniPort benefited from RSIF grant writing training at *icipe*, in January 2020.



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

AUST, BUK and UniPort have 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 AUST, BUK and UniPort libraries and their 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

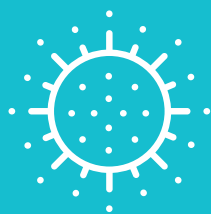
The RSIF program has supported more than 180 students. 26 of these are Nigerians. More scholars will be selected in late 2021.

The Nigerian 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 Nigeria's capacity to train at the PhD and postdoctoral level. With the ability to undertake high quality research, Nigeria 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.

60% of the Nigerian RSIF PhD scholars in the first two 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 AUST, BUK and UniPort 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.

Innovation spurs from collaborative knowledge sharing.

RSIF's establishment of international networks provides AUST, BUK and UniPort with a global pool of like-minded innovators. For example, faculty study visits were supported to Japanese universities to learn about university-industry linkages.

RSIF provides research and innovation funding for staff at AUST, BUK and UniPort. Currently funded are four 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.

Moreover, Nigerian 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 managing.

RSIF PhD scholar Susan Ojochide (Nigeria),

talks about her research that will contribute to tackling one of Africa's worst enemies: Drought.



What is the focus of your PhD research?

I commenced my PhD studies in 2020, supported by the Regional Scholarship and Innovation Fund (RSIF). I am registered in [Bayero University Kano, Nigeria, an RSIF Host University](#). My research employs earth observation datasets and climate models to investigate drought as the result of spatio-temporal variations.

My area of focus is northern Nigeria, a semi-arid region that is part of the Sahel. While this region is the major producer of cereals and grains in Nigeria, it is prone to constant drought, with significant implications for food security. I aim to develop a model integrating ground station meteorological data, earth observation data and climate models.

I will undertake part of my studies through two-year sandwich program at the [Natural Resources Institute \(NRI\), Greenwich University, United Kingdom](#), to analyse the climate models using high computational systems, and compute my results.

How does your research contribute to the sustainable development goals?

This research contributes particularly to SDG 2: Zero Hunger. Drought is one of the major causes of food insecurity in Nigeria. My findings will boost existing knowledge on this phenomenon, and also contribute to the development of early warning systems to predict possible drought episodes.

The results will be useful to agro-meteorologists, farmers, decisionmakers and indeed, many stakeholders in agricultural production. Beyond the study area, the knowledge could also be applicable to other semi-arid regions across the continent.

Read full interview [here](#)

Interview published in partnership with the United Nations Economic Commission for Africa (UNECA): [International Women's Day 2021: Future Women Leaders – Young African women scientists reflect on their research journey](#).

It also appeared in the April 2021 edition of Africa Renewal: [Tackling one of Africa's greatest enemies – Drought](#)



RSIF RESEARCH & INNOVATION PROJECTS:

Strengthening Institutional Infrastructure for an Innovation Ecosystem

Project Title: [Strengthening Institutional Infrastructure for an Innovation Ecosystem](#)

Project leader: [Professor Onyewuchi Akaranta, UniPort](#)

Collaborating partners:

1. Dukerzer Limited, Nigeria
2. WELTEK Research Limited, Nigeria

This project aims to strengthen the institutional infrastructure for a sustainable innovation ecosystem that can support graduates of the RSIF programme and the Africa Centre of Excellence for Oilfield Chemicals Research (ACE-CEFOR) to engage in applied research for sustainable development of the oil and gas industry in Sub-Saharan Africa.

The project shall also train faculty members, transform research results from laboratory through patenting to commercialization through the existing and emerging University-Industry partnerships, and develop a framework for a sustainable innovation ecosystem.

[Read more](#)

Building flood resilience and adaptation capacity of dryland rural communities

Project Title: [Do-It-Yourself Adaptation: New Pathways for Community Flood Risk Communication](#)

Project leader: [Dr Aliyu Salisu Barau, BUK](#)

Collaborating partners:

1. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India
2. ImageCat, Inc., USA

This project shifts attention to flood risk adaptation crisis in the least investigated rural dryland areas of Northern Nigeria.

The main goal of this project is to create flood resilience/adaptation capacity of dryland rural communities by developing an innovative, integrated, interdisciplinary, knowledge based, and solution-oriented approach.

The project will create a science communication system that simplifies understanding of climatic information associated with food risk for low-educated community members, especially in the north-eastern parts of Jigawa State in North- Western Nigeria.

A drylands landscape flood risk hazards toolkit will be designed that enables communities to develop hands on adaptation skills for abating flood risks. Additionally, an open source mobile app will be developed for supporting flood risk education in local languages using audio-visuals integrating local and indigenous knowledge for enhancing community adaptation strategies to climate change.

[Read more](#)



RSIF RESEARCH & INNOVATION PROJECTS:

From Research to Markets: Strengthening the Innovation Capacity of AUSTInspire

Project Title: [From Research to Markets: Strengthening the Innovation Capacity of AUSTInspire](#)

This project seeks to strengthen and expand the innovation capacity of the African University of Science and Technology (AUST) through its technology business incubator AUSTInspire and create a functional Industry Advisory Board.

Project leader: [Professor Azikiwe Peter Onwualu, AUST](#)

The project will support the development of strategic policy documents to guide innovation, intellectual property, technology transfer and commercialization for the university. It will train AUST faculty and the students on these areas to foster a culture of innovation, commercialization and academia-industry collaboration among AUST community.

Collaborating partners:

1. Ventures Platform Start Up Foundation, Worcester Polytechnic Institute (WPI), USA
2. Sheda Science and Technology Complex (SHETSCO)

[Read more](#)

Initiatives for Sustainable Food Security Innovations in the Drylands

Project Title: [Initiatives for Sustainable Food Security Innovations in the Drylands](#)

Project leader: [Professor Jibrin Mohammed Jibrin, BUK](#)

Collaborating partners:

1. International Crops Institute for the Semi-Arid Tropics (ICRISAT)
2. Manufacturers Association of Nigeria (MAN)
3. Dala Foods Nigeria Limited

Bayero University, Kano (BUK) has developed a research and innovation policy, and established a Technology Transfer Office to support innovation and commercialization of research. To consolidate on these gains and particularly to align to the national economic growth agenda of the federal government of Nigeria and the African policy drive on innovation, BUK seeks to build the capacity of its staff, improve the network of partners and collaborators, and mobilize various actors towards developing the innovation ecosystem.

The project will assist to further strengthen partnerships with industrial/sectorial stakeholders, support innovation, commercialization, and knowledge transfer to assist in achieving prosperity and sustainable food security in the drylands of West and Central Africa.

[Read more](#)

The key for ensuring the sustainability of Africa's industrialization goal is to create constructive partnerships between academic institutions and private sector.

SPOTLIGHT ON AFRICA'S FUTURE LEADERS

in Science, Engineering
and Technology

I have always been highly inquisitive; keen to understand reasons for occurrences on earth.

RSIF PhD scholar David Afolayan
African University of Science and
Technology (AUST), Africa Centre of
Excellence: Pan-African Materials
Institute (PAMI) on sandwich
research placement at Worcester
Polytechnic Institute, Boston, USA.



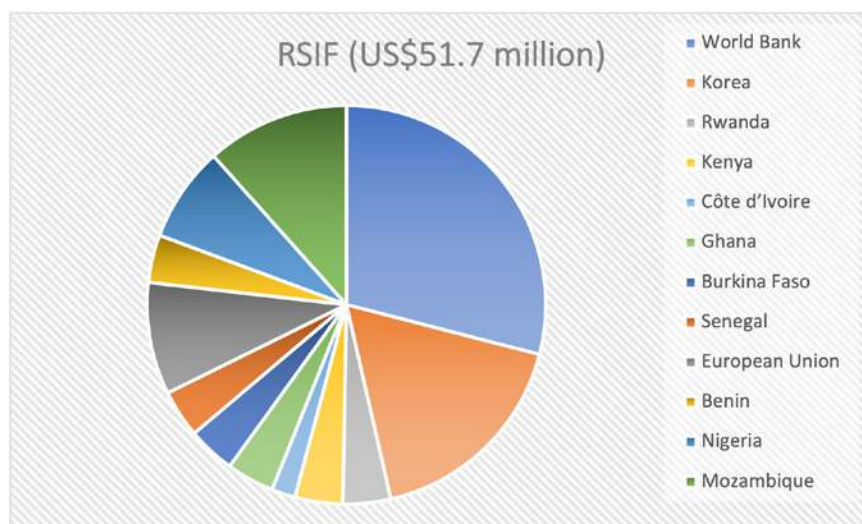
My research will contribute to develop a viable mineral processing route for Nigerian barite, upgrade the quality to American Petroleum Institute (API) standards and attract the global market for the mineral in Nigeria and other sub-Saharan Africa countries.

Nigerian RSIF scholars and Research Areas

Name	Research Topic	African Host University
David Afolayan	Optimization of Mineral Bioprocessing and Nano-based Strategies of Nigerian Barite Beneficiation for Utilization as Oil Drilling Mud and other Industrial Raw Materials	African University of Science and Technology (AUST), Nigeria Africa Centre of Excellence: Pan-African Materials Institute (PAMI)
Susan Ojochide Simon	Investigation and Prediction of the Spatio-Temporal Variation of Drought in Northern Nigeria Using Earth Observation Dataset and Climate Models	University of Rwanda, Africa Centre of Excellence in Internet of Things (ACEIoT)
Fawziyah Oyefunke Olarinoye	Hydrate Control and Management in Subsea Facilities	Kenyatta University, Kenya
Jacinta Nmutaka Umechukwu	Sustainable rural development and poverty alleviation through enhanced agriculture (case study of Nigeria)	Nelson Mandela African Institution of Science and Technology (Tanzania)
Fabian Chidubem Eze	The Impact of Occupancy on Building Energy Consumption and the Indoor Air Quality (IAQ)	University of Nairobi, Kenya

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

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.

Nigeria is encouraged to take up a leading role in PASET through contributing to RSIF and investing in the RSIF permanent fund for lasting returns.

Nigeria 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, Nigeria will be in alignment with its commitment to PASET's vision.



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

RSIF provides full doctoral scholarships and grants for research and innovation, to boost technical and scientific capacity for the advancement and use of transformative technologies to tackle Africa's most pressing challenges.

[Read more](#)

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

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