



Rsif in Korea



Research. Innovate. Transform Africa

The PASET-Regional Scholarship and Innovation Fund for Applied Sciences, Engineering and Technology in Korea



Rsif - Designed for Impact

Flagship project of PASET



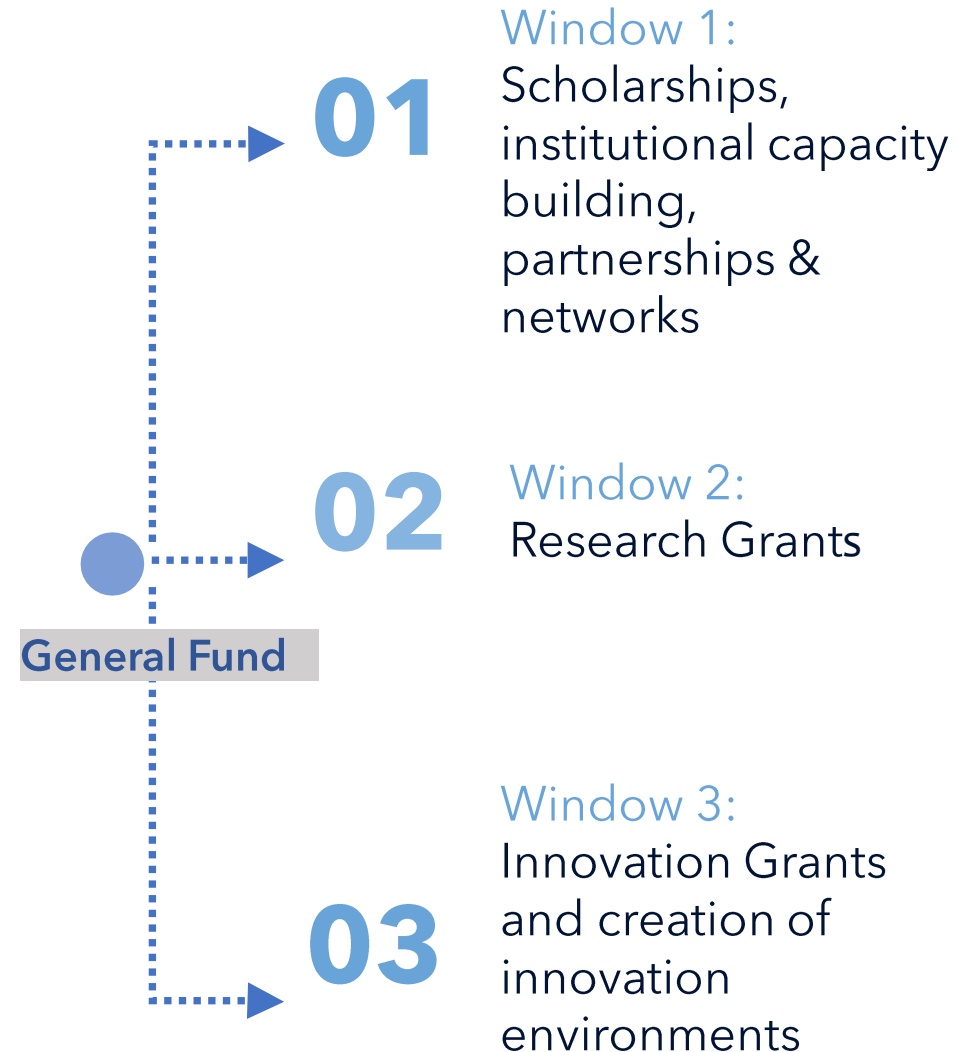
Building sustainable doctoral training, research and innovation ecosystems for development in Africa

Objectives

— Create a stock of highly skilled scientists, professionals and innovators in applied sciences, engineering and technology (ASET) areas

— Address imbalances in the number of women and disadvantaged groups in ASET fields in Africa

— Build African university capacity to provide relevant ASET training

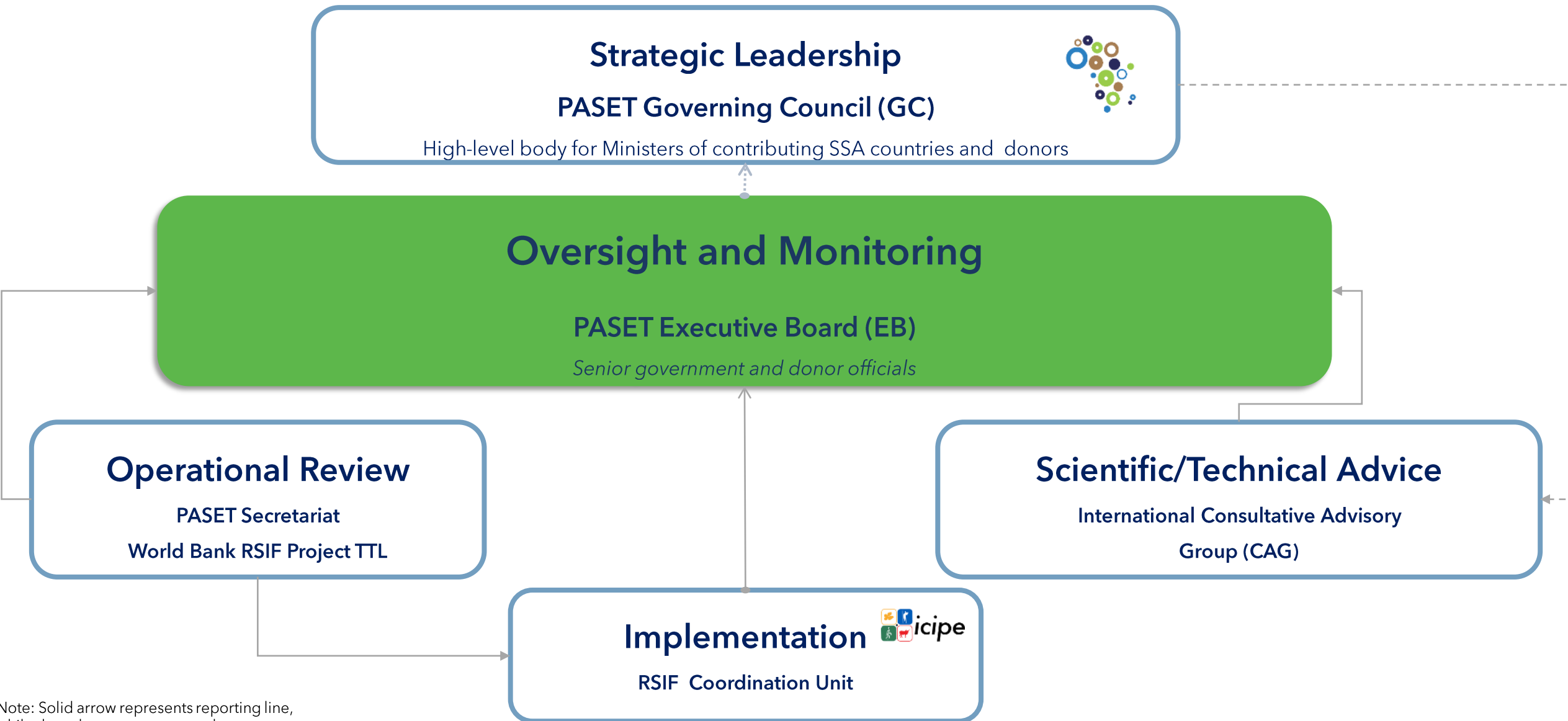


Rsif is a unique African initiative

1. Owned and managed by African governments through PASET (11 African governments)
2. To-date, investments from 9 African governments (between US\$1 -6 million each), the World Bank, Korea and other funders
3. Managed by an African led international research/innovation and training institution - *icipe*
4. Regional approach to grow Africa's STI agenda
5. Sustainability - vision to grow Rsif into a Pan-African science fund
 - establish a Permanent fund
 - exploring innovative financing and leveraging of private capital, e.g. blockchain technology, carbon credit, venture capital fund.



Inclusive, Efficient and Transparent Governance



Note: Solid arrow represents reporting line, while dotted arrow represents close working relationship

icipe Rsif - Fostering Excellence

- Highly Competitive Selection
- Ongoing Mentoring

- Selective Matching
- High Level of Interaction



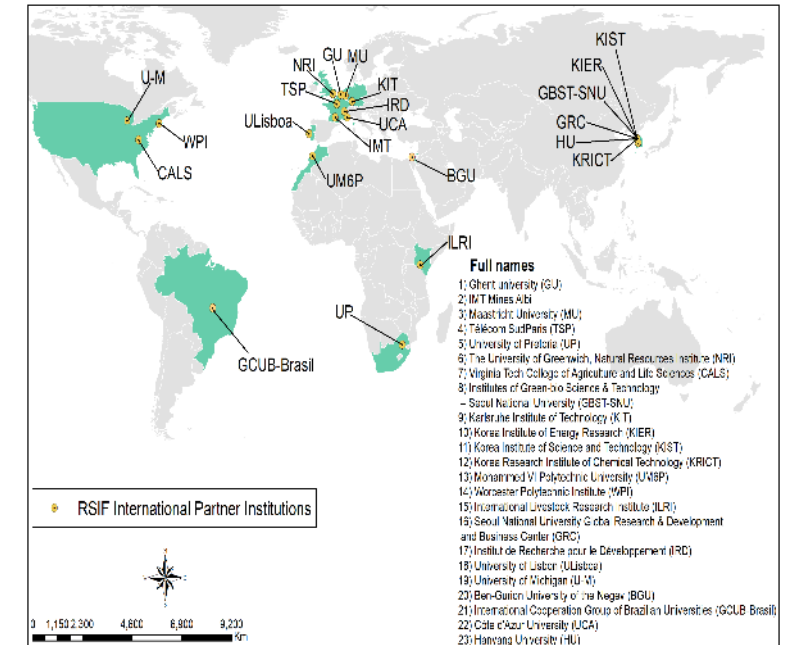
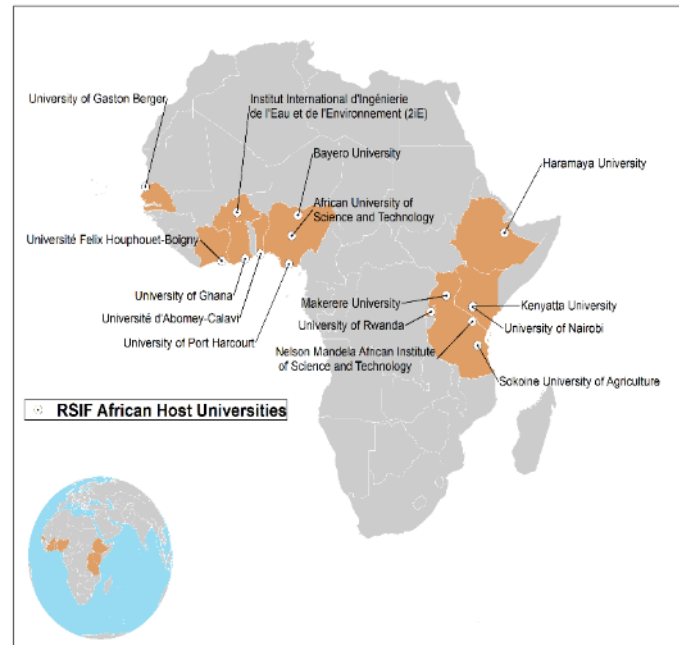
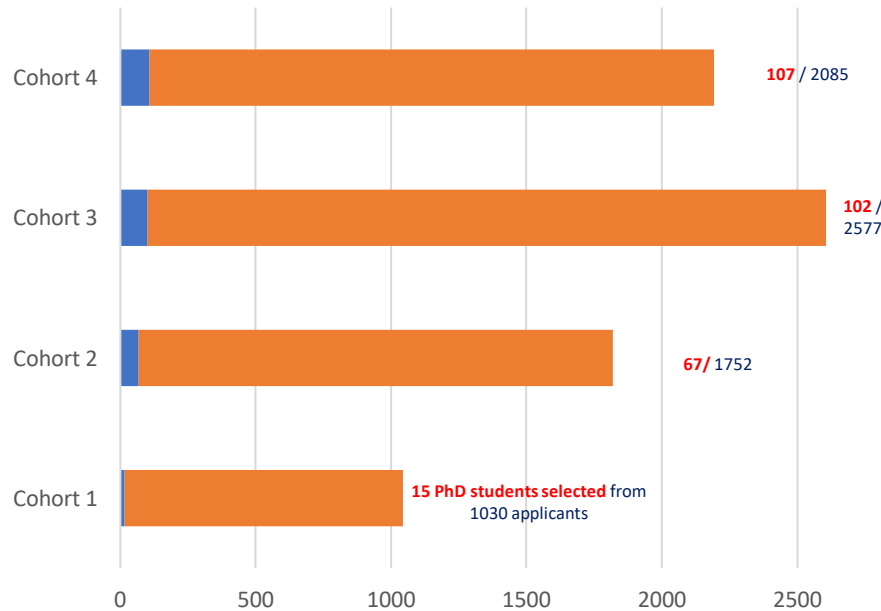
291 PhD Scholarships



15 African Host Universities
(4 AHUs admit first Rsif students in 2022)



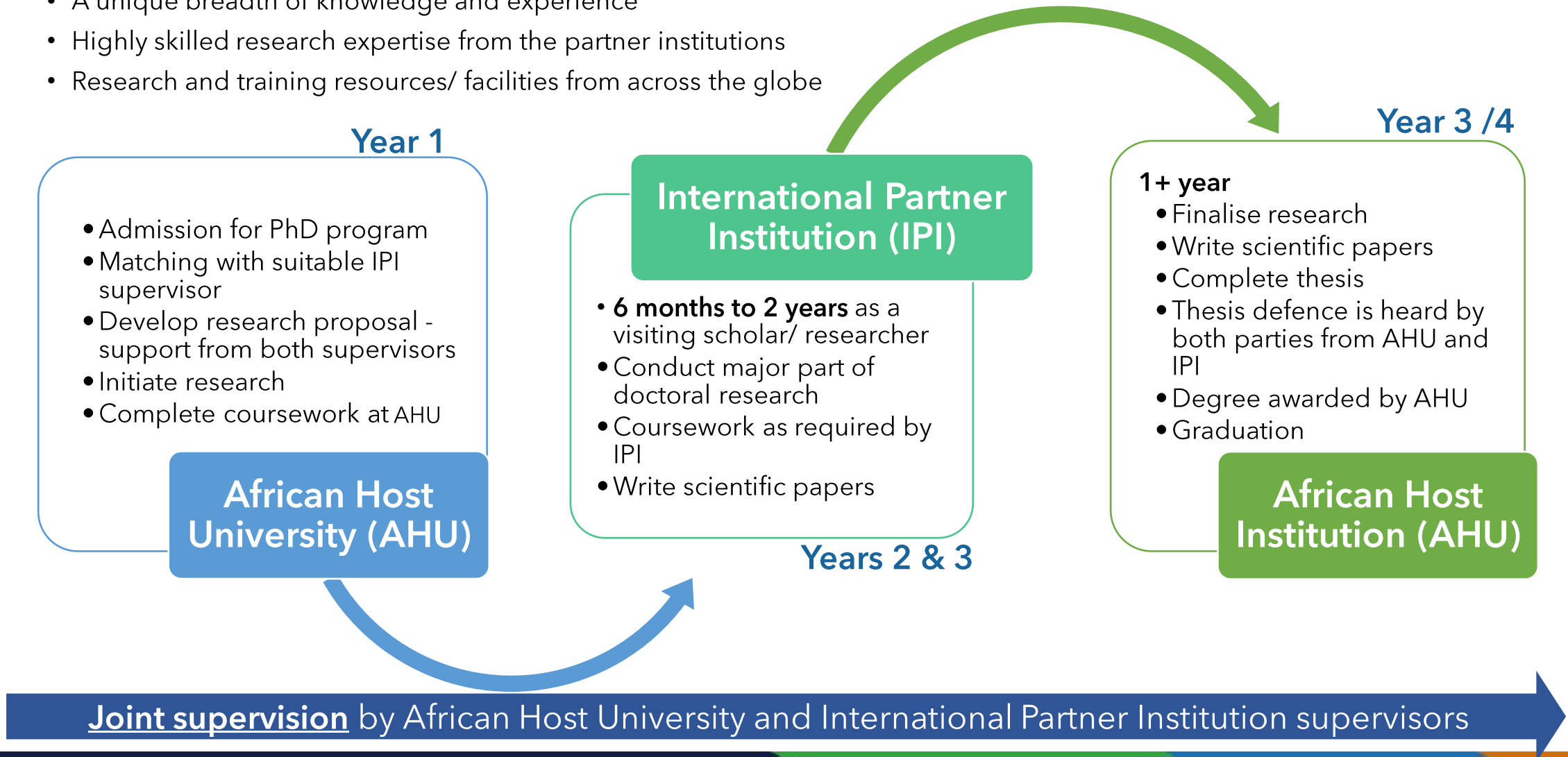
23 International Partner Institutes/universities



Rsif PhD Sandwich Model

Enables scholars and faculty members access to:

- A unique breadth of knowledge and experience
- Highly skilled research expertise from the partner institutions
- Research and training resources/ facilities from across the globe



Rsif and Korea

- Korea is a development partner member of PASET
 - Participated in PASET Forums
 - Participates in PASET Executive Board – Dr. Song Chang Hong, Director of Development Research, Center for International Development (CID), Korea Development Institute (KDI)
- Partnering with African universities in doctoral training and research collaboration
 - Hosting Africa’s future science leaders in Korea for research internship
 - Building strong research networks between Korea and Africa
- Significant benefits to Korea

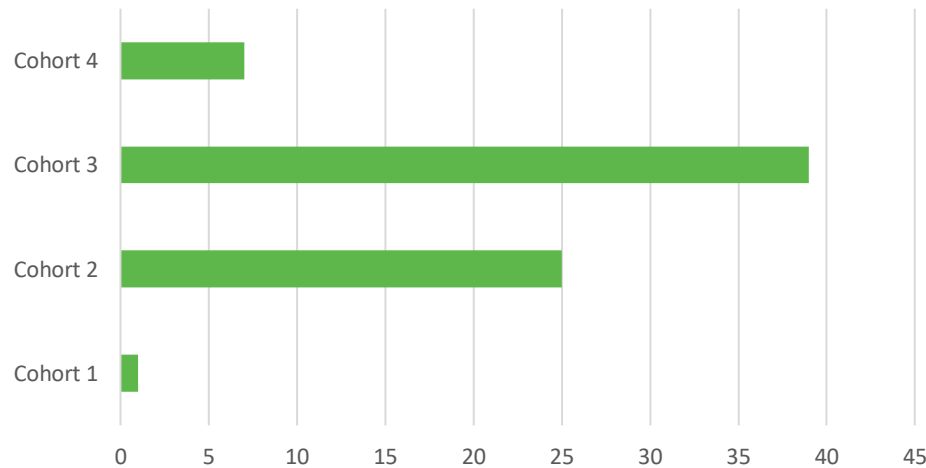


Photo: Choi, speaking at PASET Forum in Rwanda in 2019

Korean sponsored PhD Students Overview

- 72 Korean funded Rsif PhD students (44% women, 20 nationalities)
- Scholars registered under 5 thematic areas in 13 African Host Universities
- All cohorts represented with majority in cohort 3 and 2.

Korean funded Rsif PhD students by cohort

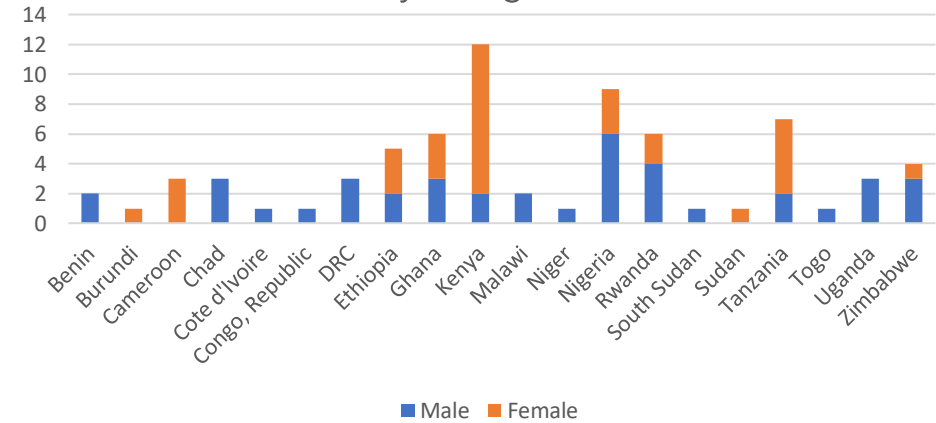


Thematic Areas	African Host University	Scholars
Climate Change (10) - 14%	Bayero University Kano, Nigeria	3
	Haramaya University, Ethiopia	2
	Université Felix Houphouët-Boigny, Côte d'Ivoire	5
ICTs including Big Data & Artificial Intelligence (8) - 11%	University of Abomey-Calavi, Benin	0
	University of Gaston Berger, Senegal	3
	University of Rwanda, Rwanda	5
Minerals, Mining and Materials Engineering (16) - 22%	African University of Science and Technology, Nigeria	3
	Kenyatta University, Kenya	5
	Nelson Mandela African Institution of Science and Technology, Tanzania	8
Food Security and Agribusiness (23) - 32%	Makerere University, Uganda	1
	Sokoine University of Agriculture, Tanzania	15
	University of Ghana, Ghana	7
Energy including renewables (15) - 21%	Institut International d'Ingénierie de l'Eau et de l'Environnement (2iE), Burkina Faso	0
	University of Nairobi, Kenya	12
	University of Port Harcourt, Nigeria	3

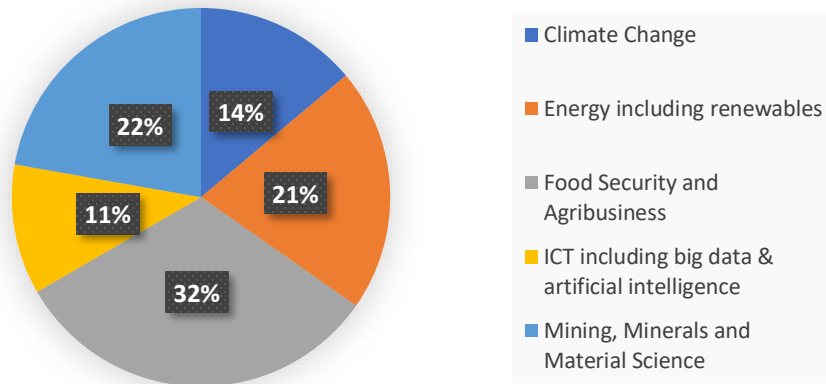
Overview of Korean funded PhD Students

- 72 Korean funded Rsif PhD students (44% women) across all five thematic areas
- 20 sub-Saharan African nationalities

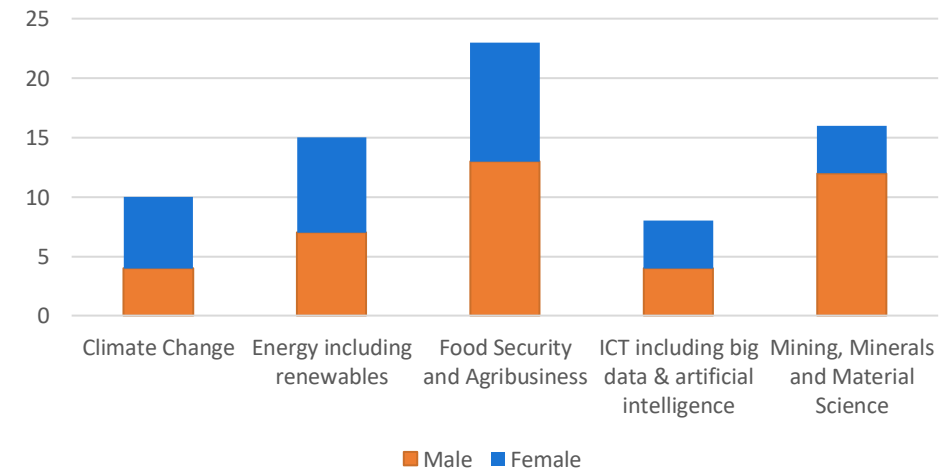
Korean funded Rsif PhD students by nationality and gender



Distribution of Korean funded Rsif PhD students by theme



Korean funded Rsif PhD students by theme



Korean supported Rsif PhD Students Status

Cohort 1

- Graduating. Returning as faculty to their home universities
- Preparing for thesis defence.

Cohort 2

- Undertaking international sandwich placement
- Writing journal articles

Cohort 3

- At African Host Universities and collecting data in the field
- Preparing for international research placements

Cohort 4

- In first year of study.
- Matching and PhD proposals in progress



Dr. Noël Gahamanyi,
Rwanda, best post-graduate student
award 2021 at
Sokoine University of
Agriculture, Tanzania



Korean Sponsored Grants Overview

- There are 21 Korean funded Rsif research grants:
 - 11 Research Awards to faculty in Rsif African Host Universities
 - 10 Junior Investigator Research Awards to Rsif PhD graduates (5 not yet awarded)
 - Funding per project is about US\$ 80,000-90,000
- Funded projects are implemented in ten different African universities in five countries (Ghana, Kenya, Rwanda, Nigeria and Tanzania)
- The research projects are across four thematic areas (see table)

Thematic Area	No of projects	Institution, Country
ICT incl. big data & artificial intelligence	4 (19%)	UR, Rwanda UMaT, Ghana
Minerals, Mining and Materials Engineering	4 (19%)	KU, Kenya NM-AIST, Tanzania AUST, Nigeria Moi University, Kenya
Food Security and Agribusiness	5 (24%)	UG, Ghana SUA, Tanzania UR, Rwanda
Energy including renewables	3 (14%)	UoN, Kenya Uniport, Nigeria
<i>Remaining to award</i>	5 (24%)	<i>To be confirmed</i>
Total projects	21 (100%)	

Example: Korea funded project strengthening research and diagnostic capacity of selected viral infections

Project Title: **Practical development of microparticles-based assay for direct detection of viral RNA from non-invasive and complex animal matrices.**

PI: Prof. Christopher Jacob Kasanga

Lead Institution: Sokoine University of Agriculture, Tanzania

Partner Institution: Korea Institute of Science and Technology (KIST)

Duration: 16 Dec-2022-15 Dec-2024

Expected project impact:

- Strengthened viral diagnostic capacity
- Baseline swine and avian influenza A and foot-and-mouth disease data in Tanzania.
- Molecular epidemiological data that impact new knowledge and understanding, contributing to more effective control of Foot and Mouth Disease and Influenza A.



Benefits to Korean Institutions



Research. Innovate. Transform Africa

Strengthening Africa-Korea research networks

Korean International Partner Institutions (IPIs) signed MOU with PASET to cooperate with Rsif African Host Universities:

1. Korea Institute of Science and Technology (KIST)
2. Korea Institute of Energy Research (KIER)
3. Korea Research Institute of Chemical Technology (KRICT)
4. Institutes of Green- Bio Science & Technology – Seoul National University (GBST-SNU)
5. The Seoul National University - Global Research & Development and Business Center (GRC)
6. Hanyang University
7. Samsung Dream Scholarship Foundation

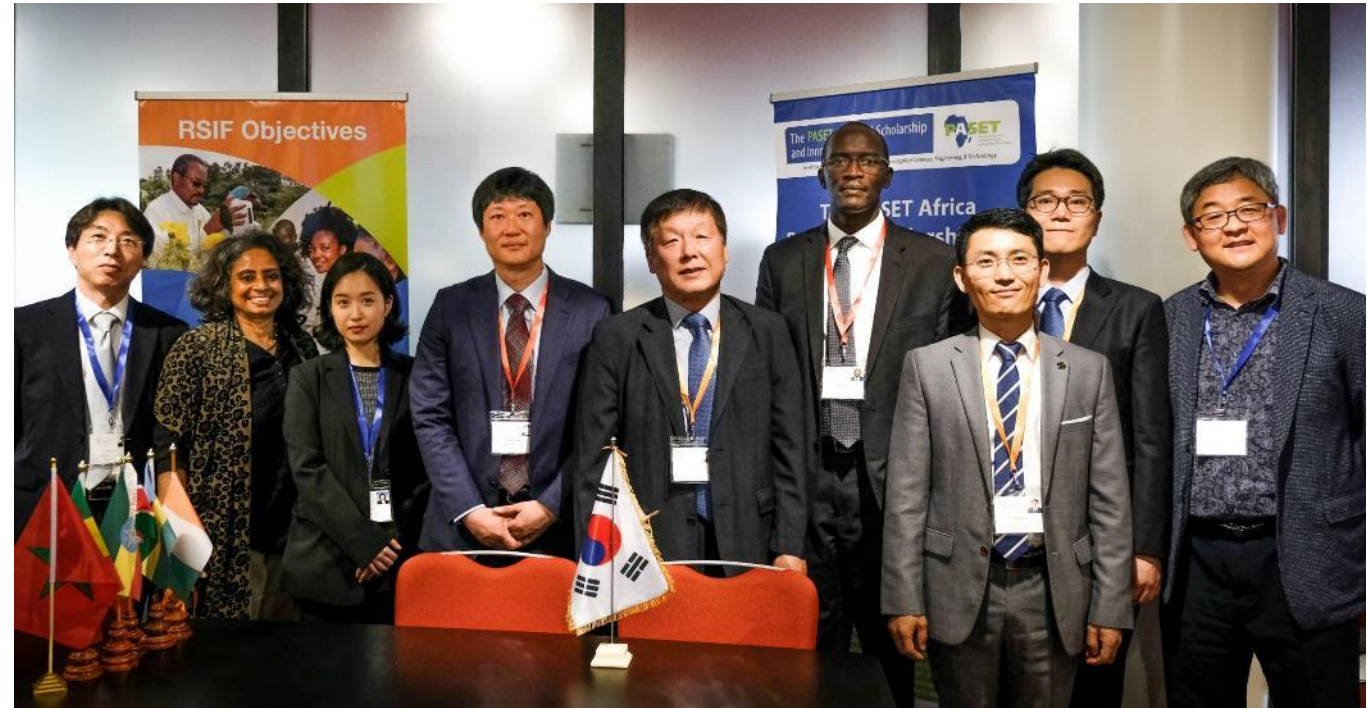


Photo: Signing of MOUs for cooperation on RSIF, May 2019 in Kigali

Rsif students matched with Korea

- So far 35 Rsif PhD scholars (11 women) have been matched with Korean universities
- 11 different nationalities (Benin, Cameroon, Chad, Ghana, Kenya, Nigeria, Rwanda, Tanzania, Togo, Uganda, Zimbabwe,
- 10 different African Host Universities (AUST, KU, NM-AIST, SUA, UFHB, UG, UGB, UoN, UniPort, UR)
- All 5 thematic areas
- Tripartite agreements signed and more under signature
- Partnership in Rsif research and innovation projects
- 4 Rsif graduates who completed their sandwich programme in Korea



GBST
서울대학교 그린바이오
과학기술연구원



GRC
Seoul National University



HANYANG UNIVERSITY

한국에너지기술연구원
KOREA INSTITUTE OF ENERGY RESEARCH

KIST
Korea Institute of
Science and Technology
KRICT
Korea Research Institute of Chemical Technology

Rsif Students Status

Korea Institute of Science and Technology (KIST) – Cohort 1

No	Name of Student	Nationality	RSIF African Host University	PhD Research Project Title	Status
1	Dr. Gahamanyi Noel	Rwanda	Sokoine University of Agriculture (SUA), Tanzania	Assessing the molecular epidemiology and antimicrobial susceptibility profiles of Campylobacter species from human and animal feces in Tanzania and Korea	Completed and graduated . 8 publications Lecturer of Medical Microbiology, School of Medicine and Pharmacy, College of Medicine and Health Sciences, University of Rwanda; Lecturer, University of Rwanda, College of Science and Technology, Biology Department. Visiting Lecturer of Genomics and Cytogenetics in MSc program; School of Veterinary Medicine ; College of Agriculture and Veterinary Medicine (CAVM) University of Rwanda. Rsif Junior Investigator Research Award.
2	Dr. Sylvia Wairimu Maina	Kenya		Deciphering Biosynthesis and utility of bioactive compounds in neglected African cabbage and Ethiopian mustard vegetables	Completed and graduated . 3 journal publication Samsung Dream Foundation Africa Scholar
3	Maxwell Wambua Waema	Kenya		Detection of selected human respiratory viruses using hydrogel microparticles based multiplex RT-Qpcr	Preparing for thesis defence
4	Dr. Humphrey Andalo Mabwi	Kenya		Potential use of synthetic human gut microbiome communities in screening phytochemicals beneficial to intestinal flora	Completed and graduated .
5	Emmanuel Kifaro	Tanzania		Development of Microparticles qPCR for the Detection of Selected RNA viruses from Non-Invasive Animal Specimens	Preparing for thesis defence
6	Dr. Sodedji Frejus Ariel Kpedetin	Benin	University Felix-Houphouet Boigny, Cote d'Ivoire	Genetic diversity and optimization for increased carotenoids biosynthesis in cowpea [Vigna unguiculata (L.) walp]	Completed and graduated . 4 publications. Samsung Dream Foundation Africa Scholar

Emerging impact - set to "snowball"...

First Rsif graduate to return home (2021)



Dr. Noël GAHAMANYI, Rwanda,
Rsif Cohort 1 Alumnus

Graduated from Sokoine University of
Agriculture, Tanzania

Best post-graduate thesis award 2021

Completed his research placement at Korea
Institute of Science and Technology.

Research area: Molecular Epidemiology and
Antimicrobial resistance

8 journal publications in period

Rsif research award to kickstart research career

- Founding member Rsif Alumni network
- Speaker at Rsif Conference 2022 in Morocco
- Returned to University of Rwanda, training the next generation of science leaders. Solving critical problems

Korea Institute of Science and Technology -2

No	Name	Cohort	Nationality	Gender	African Host University	Research Topic	Status
7	Bethwel Kipchirchir Tarus	2	Kenya	Male	Nelson Mandela African Institution of Science and Technology (NM-AIST), Tanzania	Brackish Water Desalination by Capacitive Deionization using Beaded Electrospun Carbon Nanofibers	
8	Hissein Hassan Abdel-Razakh	2	Chad	Male	Sokoine University of Agriculture, Tanzania	In vitro studies of the antimicrobial and antioxidant properties of selected Chadian medicinal plants	
9	Abdulrahman Adeiza Musa	3	Nigeria	Male	African University of Science and Technology	Design Optimization and Properties Evaluation of Hybrid Natural Fiber Reinforced Polymer Matrix Composite for Sustainable Automotive Materials	
10	Chiedza Hwata	3	Zimbabwe	Female	University of Rwanda	IoT based Electromagnetic Compatibility Monitoring System for Biomedical Devices	

- Example of institutional research collaboration: In 2023-2024, KIST is partnering with researchers at Sokoine University of Agriculture in Tanzania on a research project in “Practical development of microparticles-based assay for direct detection of viral RNA from non-invasive and complex animal matrices”.



Video - Meet Bethwel Tarus

RSIF PhD student at NM-AIST,
Tanzania with international
research placement at Korea
Institute of Science and
Technology, Korea

Video link:

<https://www.youtube.com/watch?v=A0554E0-9ik>

Institutes of Green-Bio Science & Technology Seoul National University



No	Name	Cohort	Nationality	Gender	African Host University	Research topic	Status
1	Celestin Sirumu	2	Rwanda	Male	Sokoine University of Agriculture, Tanzania	Exploiting natural antimicrobials for food biopreservation focusing on microbial safety, quality and shelf life	Returned to SUA
2	Harry Bleppony	2	Ghana	Male	University of Ghana, Ghana	Performance of Non-Traditional Agricultural Exports in Ghana	In Korea
3	Esther Aba Eshun	2	Ghana	Female		Livelihood Diversification and Food Security of Youth Headed Households in Coastal Fishing Communities in Ghana	
4	Saani Nassam Iddrisu	2	Ghana	Male		Analysis of Demand and Financial Viability of Processed Mushrooms in Ghana	In Korea
5	Nana Okyir Baidoo	2	Ghana	Male		Economic Profitability Of Diversified Cocoa Farmers In The Western, Western North And Ashanti Regions Of Ghana	In Korea 1 publication
6	Rosalyn Naa Norkor Baddoo	2	Ghana	Female		Livelihood and food security status of rice value chain actors in the Volta and North East regions of Ghana	
7	Benjamin Musah Abu	2	Ghana	Male		Smallholder agricultural commercialization, and food and nutrition security in Ghana	3 publications
8	Linda Bih Numfor	2	Cameroon	Female	NM-AIST, Tanzania	Synthesis and Comparative Study of Activated Biochars' and Clay Balls' Capacity for Heavy Metal Removal from Wastewater for Selected Industries	



Video - Meet Linda Bih Numfor

Rsif PhD student at NM-AIST,
Tanzania with international research
placement at Institutes of Green-Bio
Science & Technology,
Seoul National University, Korea

Video link:

https://www.youtube.com/watch?v=-Dli2D2V_dl

Global R&D and Business Center (GRC) Seoul National University



No	Name	Cohort	Nationality	Gender	African Host University	Research topic	Status
1	Benjamin Sarfo	2	Ghana	Male	University of Ghana Ghana	Impact of Safe Food Business Practices on Street Food Vendors Business Performance in Urban Ghana	
2	Motin Bashiru	2	Ghana	Male		Renewable resources use in smallholders' integrated farm model: A design thinking approach for sustainable farm enterprise in Ghana	
3	Barbara Kabwiga Asingwire	2	Uganda	Female	University of Rwanda, Rwanda	Architectural Design of IoT-based Healthcare Heterogeneous Traffic: Performance Analysis and Optimization	1 publication
4	Eric Nizeyimana	2	Rwanda	Male		A Decentralized Blockchain-Based Air Pollution Spikes Monitoring Framework Over Intelligent IoT Edge Networks	2 publications
5	Fidele Maniraguha	2	Rwanda	Male		Monitoring Agriculture Pest Insects using Dual-Polarization Weather Radars	4 journal publications
6	Theofrida Maginga	3	Tanzania	Female		Convergence of IoT, Mobile Vision AI and Natural Language Processing to Support Low-Literacy Rural Farmers in Early Detection of Crop Diseases: Case study of Maize in Tanzania	1 journal publication
7	Gerard Kponhinto	2	Benin	Male	University of Gaston Berger, Senegal	Data Collection and Transmission in the Internet of Things	

Video - Meet Barbara Kabwiga Asingwire

An Rsif PhD scholar at the University of Rwanda with research placement at Global R&D and Business Center (GRC) Seoul National University, Korea

Video link:

https://www.youtube.com/watch?v=0WdB_sP7EZY



Korea Institute of Energy Research (KIER)



No	Name	Cohort	Nationality	Gender	African Host University	Research topic	Status
1	Fawziah Oyefunke Olarinoye	2	Nigeria	Female	University of Port Harcourt, Nigeria	Agro-Waste Based Amino Acids as Kinetic Hydrate Inhibitors	
2	Jacinta Okwako	2	Kenya	Female	University of Nairobi, Kenya	Fabrication of self-powered photoelectrochromic device for smart window application	In Korea. Samsung Dream Foundation Africa scholar
3	Fabian Chidubem Eze	2	Nigeria	Male		Modeling and Simulation of Solar-assisted Dual Source Heat Pump System for Space Heating and Cooling	In Korea. Samsung Dream Foundation Africa Scholar
4	Christelle Arielle Mbouteu Megaptche	3	Cameroon	Female		The Development of an Energy Management System for Optimal Sizing of a Hybrid Micro-Grid with an Energy Storage System	
5	Mahamat Adoum Abdoulaye	3	Chad	Male		Development of an innovative sector coupling integrating renewable energy	
6	Jean D'Amour Mwongereza	3	Rwanda	Male		The optimal selection of biomass materials for bioenergy production Case Study Rwanda	
7	Ishaq Kariim	3	Nigeria	Male	NM-AIST, Tanzania	Performance investigation of nano-hybrid catalysts for biocrude upgrade into biojet fuel	
8	Maklewa Agoundedemba	3	Togo	Male	Kenyatta University, Kenya	Improving the performance of FTO/TiO ₂ /In ₂ S ₃ /CuInS ₂ photovoltaic solar cell by Introducing ZnO thin layer	

Video - Meet Jacinta Okwako

Rsif PhD student at University of Nairobi, Kenya with international research placement at Korea Institute of Energy Research, Korea

Video link:

<https://www.youtube.com/watch?v=q-9Wb3quGsc>



Korea Research Institute of Chemical Technology (KRICT)



No	Name	Cohort	Nationality	Gender	African Host University	Research topic	Status
1	Jorim Okoth Obila	2	Kenya	Male	University of Nairobi, Kenya	Stability and efficiency improvement of planar 3D/2D tin-based-perovskite solar cells	At KRICT 2 publications
2	Mwende Mbilo	2	Kenya	Female		Design of efficient and stable non-fullerene acceptor-based organic solar cells by buffer layer modification	At KRICT 6 publications

Hanyang University

Rsif research project in Tanzania

Title: **Fluoride removal from drinking water using capacitive deionization**

Project Leader: Dr Yusufu Abeid Chande Jande, NM-AIST

Challenge: High concentration of fluoride in water (above 1.5 ppm) causes dental and skeletal fluorosis problems. Most of the Rift Valley region in Eastern Africa, water sources contain high concentration of fluoride. This makes the existing water unsafe for drinking.

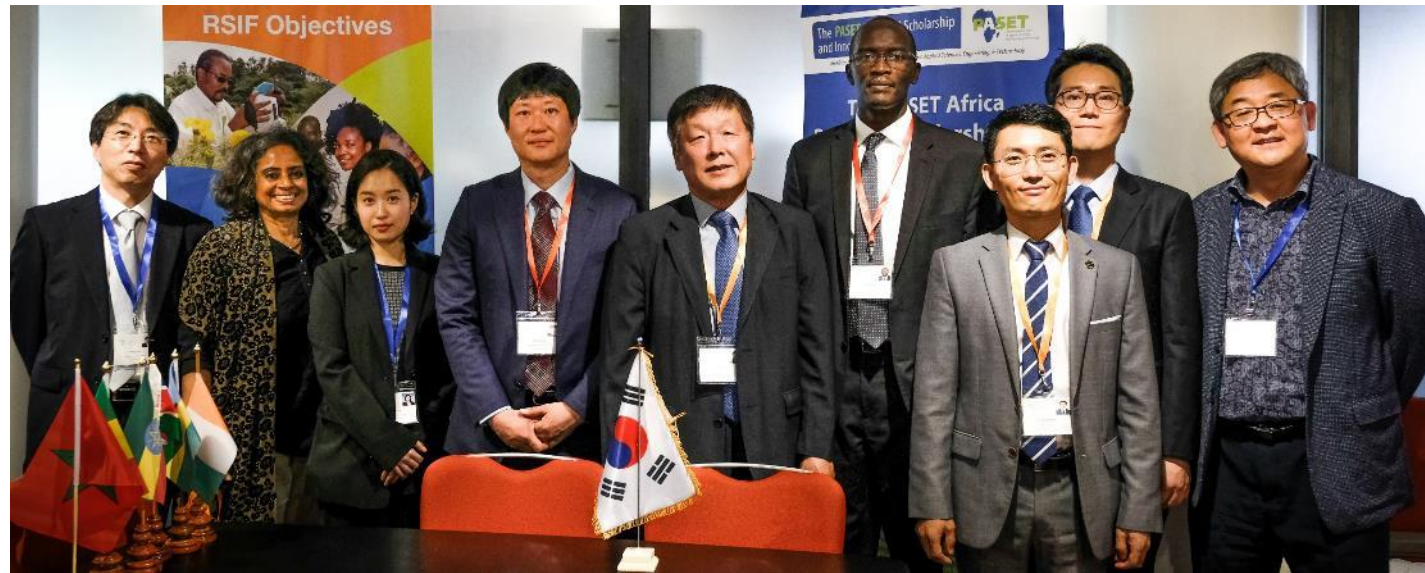
The technology: CDI as an emerging technology consumes less energy compared to traditional methods. This research intends to design the CDI system for defluoridation using the biomass-based electrode materials (agricultural wastes like rice husks).

Expected impact: Increased availability of clean and safe water by regulating the fluoride content in water within the recommended World Health Organization levels.

Rsif student matching with Hanyang University is in progress



Photo gallery



Thank You

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