



KOREA

Population: 51.6 million (2022)

Research and development expenditures as a proportion of GDP: 4.93% (2021)

Researchers (in full-time equivalent) per million inhabitants: 9082 (2021)

Scientific and technical journal articles: 72490 thousand (2020)

Source: World Bank Data 2023



KOREA Country Report 2023

Korea is the world's most R&D intensive country with a GERD of 4.93% according to UNESCO and is a global leader in innovation and transformative technologies for jobs and skills development. Korea's development experience and technical expertise can be adapted in priority sectors in Africa for inclusive and sustainable development.

Contribution to PASET-Rsif

Korea is contributing to the Regional Scholarship and Innovation Fund (Rsif) of the Partnership for skills in Applied Sciences, Engineering and Technology (PASET), since 2018 (Figure 1). Its contribution of USD 9 million is through the Korea-World Bank Group Partnership Facility to train Sub-Saharan African PhD students and to provide pilot grants for research and innovation projects in strategic high potential sectors.

The partnership between the Government of Korea, universities and PASET-Rsif contribute to boost exchange between African and Korean universities, researchers and faculties in the science and technology area. Through PASET-Rsif Korea will share its development experience and technical expertise to build strong institutions and future science leaders to drive science and technology-led growth and inclusive sustainable development.

Why Rsif matters

- **Training African future science leaders:** Combining intra-Africa academic exchange and hosting of talented young African scientists in Korean institutions.
- **Wider academic and research network:** Building strong partnerships with Africa's leading universities and research institutes.
- **Regional integration within Africa:** Collaborating with centers of excellence and innovation ecosystems for mutual benefit.
- **Better economies of scale:** Pan-African partnerships, and a jointly pooled science fund professionally managed by the Rsif Regional Coordination Unit at icipe.

Rsif thematic areas



Korea and Rsif at a glance

72 Korean funded Rsif PhD students (20 African nationalities, 44% women).

39 African Rsif PhD students with research placement in Korean institutions.

7 Rsif partner institutions in Korea.

19 Korean funded Rsif projects (in 13 universities, in 6 African countries).

Rsif contributions (in mill. USD)

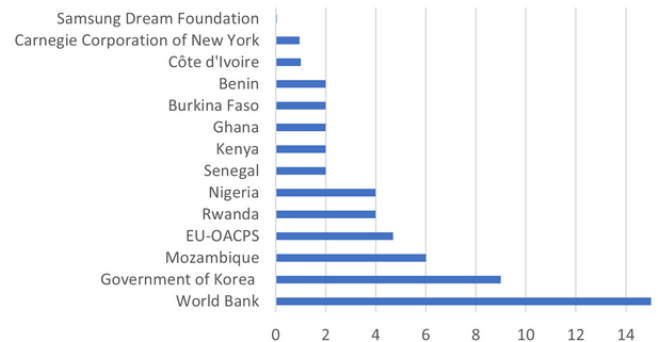


Figure 1: Rsif Contributing Countries and Partners

Strengthening research collaboration between Korea and Africa

The 72 Korean funded Rsif PhD students are registered in one of the 15 Rsif African Host Universities (Figure 2).

They spend 6-24 months for the 'sandwich programme' at an advanced international partner institution conducting collaborative research. 40 Rsif scholars have been matched with Korean partner institutions (Figure 3) for research placement in Korea.

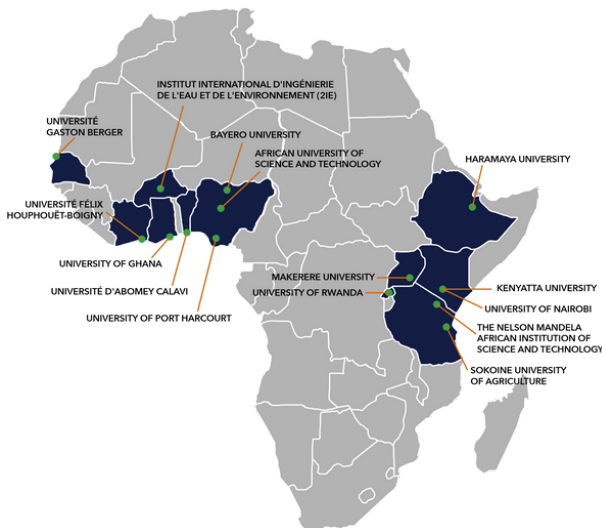


Figure 2: Rsif African Host Universities

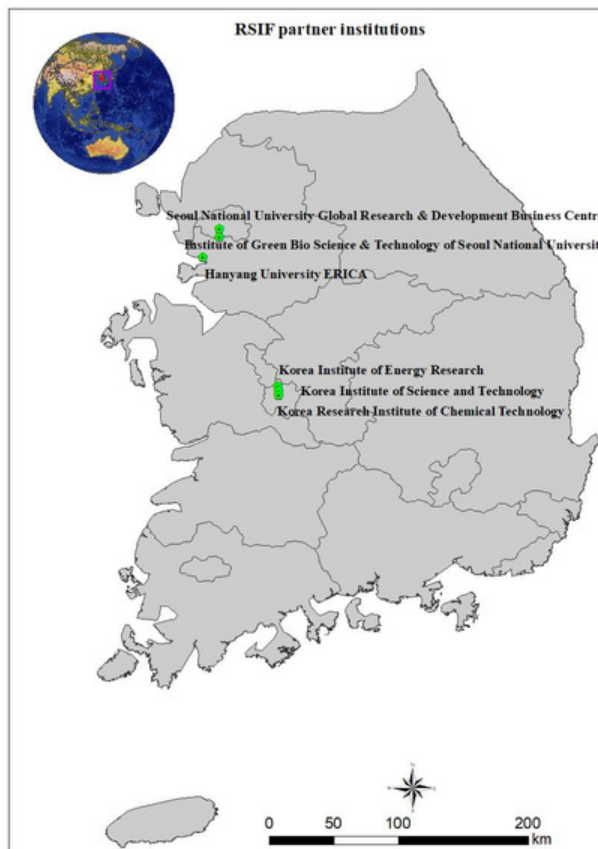


Figure 3: Rsif Partner Institutions in Korea

Spotlight on African Rsif scholars in Korea Research contribution to a sustainable future

Ms Christelle Arielle Mbouteu Megaptche

Research area: The development of an energy management system for optimal sizing of a hybrid microgrid with different energy storage systems.

Rsif research placement at the Korea Institute of Energy Research, Jeju Global Research Center (2023-2025) and registered for a PhD in Physics at University of Nairobi, Kenya.

Christelle, a Cameroonian national, received a Best Paper Award for outstanding contribution to the 12th Asia-Pacific Forum on Renewable Energy (AFORE), in Jeju, 7-11 November 2023.

Her paper was on Techno-Economic Comparative Analysis of Photovoltaic Panel/Wind Turbine/Hydrogen Storage, Photovoltaic Panel/Wind Turbine/Battery Systems for Powering a Simulated House including Hydrogen Vehicle Load at Jeju Island, published in Energies journal [here](#).

Her PhD research work has also been published in the Journal Energy Conversion and Management (Impact factor of 10:4) [here](#).



Photo: Christelle (on the right) received a Best Paper Award at the 12th Asia-Pacific Forum on Renewable Energy (AFORE) in Jeju, 7-11 November 2023.

“ In Africa, our journey towards clean energy is not just a possibility; it's an imperative. Our rich natural resources are the key to sustainable, accessible energy for all, shaping a greener, brighter future. ”

Christelle, Rsif scholar in Energy including renewables funded by Korea through a PASET-Rsif scholarship.

Antimicrobial Resistance



Dr Noël Gahamanyi (Rwanda)

Rsif research placement at Korea Institute of Science and Technology (KIST) (2019-2021). Graduated from Sokoine University of Agriculture, Tanzania with best postgraduate thesis award 2021-22. Currently Director of Microbiology Unit, Rwanda Biomedical Center and Visiting lecturer at the University of Rwanda.

Recipient of an Rsif Junior Investigator Research Award (U\$80,000)

Research area: Prevalence, antimicrobial susceptibility profiles, and genotypes of thermophilic *Campylobacter* species from humans and animals in selected regions of Rwanda

Biocrude for Renewable Energy



Mr Ishaq Kariim (Nigeria)

Rsif research placement at Korea Institute for Energy Research (KIER) (2023-2024). PhD student in Material Science and Engineering at the Nelson Mandela African Institution of Science and Technology in Arusha, Tanzania. Faculty at Federal University of Technology, Minna, Nigeria.

Publication in Journal of Bioresource Technology (Impact Factor 11:4) [here](#)

Research area: Performance investigation of hybrid catalysts for upgrading of biocrude derived from biomass into biojet fuel.

Solar Energy Solutions



Ms Mwende Mbilo (Kenya)

Rsif Research placement at Korea Research Institute of Chemical Technology (KRICT) (2022-2023). Registered for PhD in Physics at University of Nairobi, Kenya.

Research area: Design of efficient and stable non-fullerene acceptor-based organic solar cells by buffer layer modification.

Received the 2023 L'Oréal-UNESCO For Women in Science Sub-Saharan Africa Award for Innovating Science to improve solar energy solutions in Kenya.

Blue Economy



Dr Sylvia Wairimu Maina (Kenya)

Rsif research placement at the Korea Institute of Science and Technology (KIST) (2019-2021) with support from the Samsung Dream Scholarship Foundation. PhD from Sokoine University of Agriculture, Tanzania in 2023. Currently a lecturer at Mt. Kenya University, Kenya.

Recipient of an Rsif Junior Investigator Research Award (US\$ 80,000).

Research area: Innovative steps for utilizing seaweeds along Kenya's coast as a source of sustainable food and health-promoting bioactive components

Rsif awards competitive research and innovation grants that complements the PhD training at African universities by supporting research that promotes scientific excellence and use of knowledge for sustainable development impact.

Capacitive deionization technology for clean and safe water

Project title: Fluoride removal from drinking water using capacitive deionization

Project leader: Prof. Yusufu Abeid Chande Jande, Deputy Centre Leader of Water Infrastructure and Sustainable Energy Futures Centre at the Nelson Mandela African Institution of Science and Technology (NM-AIST), Tanzania

Partners: Prof. Young-Deuk Kim, Hanyang University and Mr. Insoo Chang, ART Plus Co. Ltd, South Korea



Photo: Tusekile Alfredy is one of the Korean funded Rsif PhD students at NM-AIST who are part of the project team.

In most of the Rift Valley region in Eastern Africa, water sources contain high concentration of fluoride, which makes it unsafe for drinking. High concentration of fluoride in water (above 1.5 ppm) causes dental and skeletal fluorosis problems.

The project intends to produce the capacitive deionization (CDI) stack that will be used to remove fluoride from water.



Photo: CDI prototype

The use of CDI as an emerging technology has various advantages; one of them is less energy consumption. This research intends to design the CDI system for defluoridation using the biomass based electrode materials (agricultural wastes like rice husks).

The CDI laboratory renovation has been completed for the benefit of PhD and Master students at NM-AIST. Research findings by the Tanzanian researchers in collaboration with the Korean partners have also been published in peer reviewed scientific journal Environmental Science: Water Research & Technology [here](#).

“The prototype for water purification has been developed in collaboration with ART Plus, South Korean company. The support of an industrial company has played a key role in facilitating the development of a functional prototype that will be patented and commercialization potential explored jointly.”

Prof. Yusufu Abeid Chande Jande, NM-AIST.



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