

Rsif Horizons

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In this issue

Rsif's Impact: A Journey to the L'Oréal-UNESCO Award

Voices of impact

Unlocking Tomorrow with Cutting-Edge Doctoral Training

Emerging technologies

Contents

03 Note by *icipe* Director General

04 Our Journey

06 About Rsif

07 **Main feature:** Rsif's Impact on Women in Science: A Journey to the L'Oréal-UNESCO Award

10 **News:** Unlocking Africa's Potential: A Call to Transform STEM for Global Impact

12 **Rsif Year in Brief:** Pictures of conferences and events

14 Our partners

15 Emerging technologies

17 Voices of impact

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Note by *icipe* Director General

Skilling for Africa's Green Economy Future of Work



Dr Abdou Tenkouano, Director General of the International Centre of Insect Physiology and Ecology (*icipe*)

The PASET Regional Scholarship and Innovation Fund (Rsif) being a human capital development initiative, is playing a crucial role in Africa's sustainable development agenda. It is important to recognize that need for skills to support the continent's green economy growth pathway. A green growth pathway has never been clearer especially this time when the world is experiencing climate change, and the need for resilient food and health systems and sustainable practices. *icipe* through its work and PASET-Rsif is contributing sustainable solutions to these development challenges.

Africa's Green Economy Vision

The good news is that African countries are increasingly aware of the need to transition towards green economies—that fosters creation of jobs while prioritizing sustainability. The PASET Rsif is at the forefront of this shift by supporting doctoral training, research, and innovation across 15 selected African Host Universities (AHUs) in collaboration with 32 International Partner Institutions (IPIs). This collaboration with IPIs is a great step towards developing a skilled scientific workforce, which is critical in creating a more sustainable future for the continent and beyond.

Empowering Future Leaders

PASET Rsif through *icipe* serving as the Regional Coordination Unit (RCU) has so far enrolled 302 doctoral students from 24 nationalities, with a commendable representation of women at 40 per cent. So far 43 of these have completed their PhD programmes and majority have already returned to contribute to socio economic development in their home countries. The scholars are engaged in 53 innovative research projects that span critical thematic areas such as ICT including big data and artificial intelligence, Food security



and agri-business, Minerals, mining and materials engineering, Energy including renewables and Climate change. Each of these PASET Rsif thematic priorities is vital for Africa's green economy and requires unique skill sets that can adapt to the evolving demands of the future workforce hence our collaboration with AHUs and IPIs.

The Role of Science and Innovation

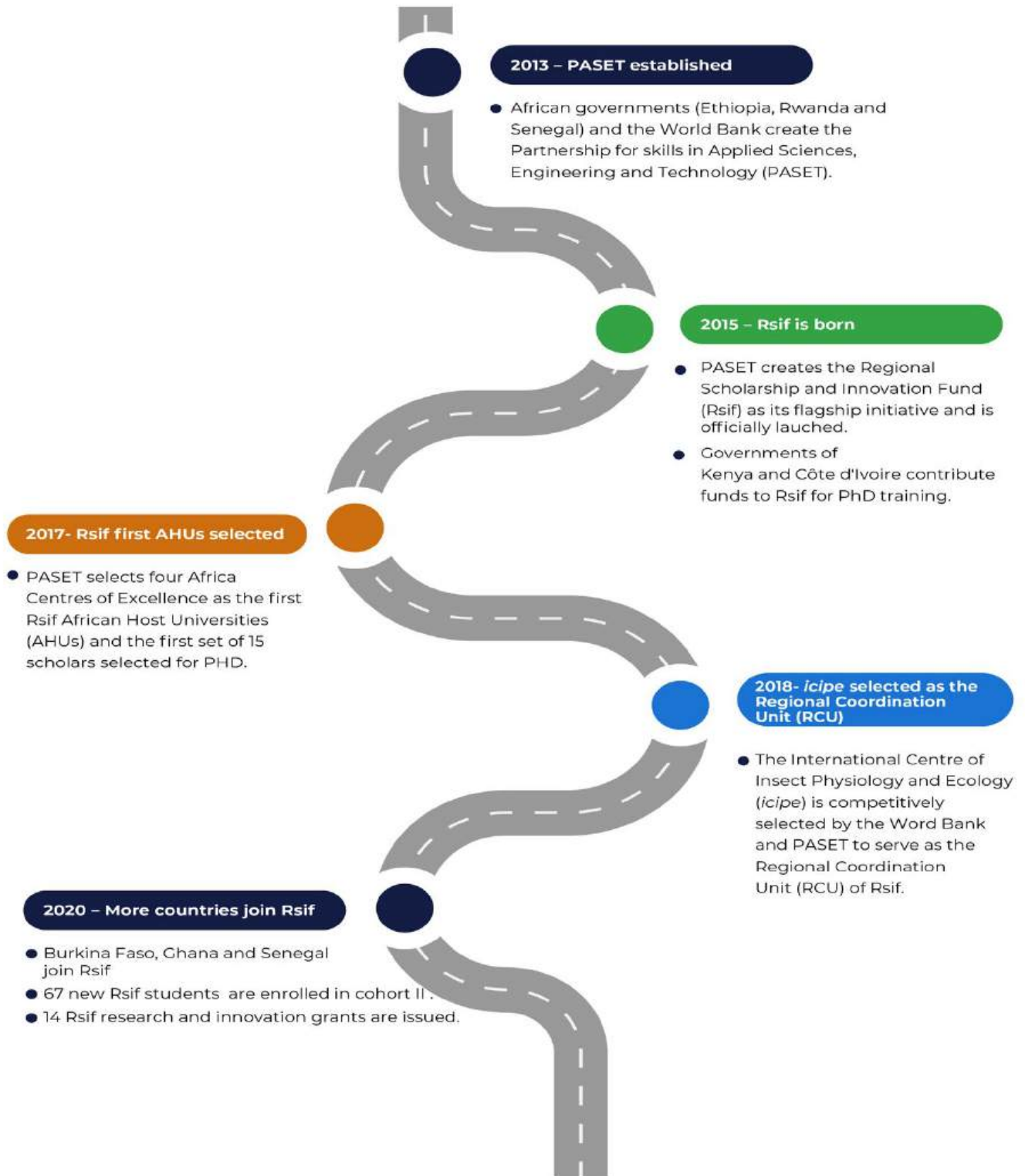
PASET Rsif harnesses the potential of science and innovation to effectively respond to climate change and promote sustainable development. The Rsif model does not only focus on academic excellence but practical solutions of real world problems. Rsif scholars are equipped with the necessary knowledge and tools to be at the fore front of driving Africa's green economy agenda.

Collaboration for Impact

By engaging various stakeholders — including policymakers, private sector actors, and development partners — a robust ecosystem that supports sustainable practices across all sectors can be created. Looking to the future, it is important to remain steadfast in all commitments to cultivate a green economy in Africa.

icipe as Rsif RCU stands ready to lead this through nurturing talent, fostering innovation, and promoting sustainable practices that will benefit not only our continent but also our planet. Together, we can build a green economy. Thank you.

Milestones



2021 - Benin and Mozambique join

- Rsif gets first graduates.
- 102 new Rsif students selected in cohort III.
- African Host Universities (AHUs) increase to 15.

2022 - Nigeria joins Rsif

- 33 Rsif Research and Innovation Grants issued.
- Rsif Alumni Association formed.
- 107 new Rsif students are awarded in cohort IV.
- Rsif graduates increase to eight.

2023 - Rwanda renews contribution to Rsif

- Rsif graduates reach 12.
- Rsif students' publications surpass 178.
- Rsif graduates exhibit at the PASET governance meeting in Kigali, Rwanda.

2024 - Kenya renews contribution to Rsif

- Rsif scholars increase to 302.
- Rsif publications increase to 355.
- 43 Rsif scholars graduated.
- Rsif International Partner Institutions (IPIs) increase to 32.



About Rsif

Rsif offers opportunities for African countries to train new doctoral students in applied sciences, engineering and technology, in competitively selected African universities partnered with international universities. Beyond doctoral training, Rsif systematically nurtures research capacity by fostering partnerships between universities and domestic and international firms to find solutions to local challenges.

Rsif is the flagship programme of the Partnership for Skills in Applied Sciences, Engineering, and Technology (PASET), managed by the International Centre of Insect Physiology and Ecology (*icipe*) as the Regional Coordination Unit.

The approach followed by Rsif of supporting three windows, scholarships together with research and innovation grants that improve the quality and relevance of the PhD programs and guarantee continuity and sustainability of research and innovations once the scholars graduate, follows global best practices for such programs.

Why Rsif matters



High quality PhD training:

Combining intra-Africa academic exchange and global partnerships for world-class doctoral training.



Wider research network:

Research placement at advanced institution for exposure and connecting with global research networks.



Regional integration:

Strengthening Africa's centers of excellence and innovation for regional benefit.



Economies of scale:

Pan-African partnership with a jointly pooled science fund professionally managed by the Rsif Regional Coordination Unit at *icipe*.

Rsif scholar's journey to L'Oréal-UNESCO Award

By Janet Otieno

Rsif's Impact on Women in Science: A Journey to the L'Oréal-UNESCO Award

The L'Oréal-UNESCO For Women in Science Young Talents Programme in Sub-Saharan Africa has been a beacon of recognition for outstanding female researchers for 15 years. Recently, Regional Scholarship Innovation Fund (Rsif) scholar Dr Ruth Lorivi Moirana was among the recipients of this prestigious award, which honours young women scientists for their groundbreaking work.

The 2024 regional award ceremony, held in December in Cotonou, Benin, celebrated 30 talented women from 16 African countries, including 25 PhD students and 5 post-docs, who were selected from nearly 800 applicants for their innovative projects addressing the continent's major challenges. This recognition not only highlights their scientific excellence but also underscores Rsif programme's commitment to empowering women in science across Africa.

Upskilling Africa's green economy

Their groundbreaking work also contributes to upskilling Africa's green economy, advancing sustainable solutions that are critical for the continent's future growth and environmental resilience

Dr Moirana completed her PhD thesis at the Nelson Mandela African Institution of Science and Technology (NM-AIST) in Tanzania. Her research topic was on "remediation of soils contaminated with fluoride using seaweed-derived materials."

Early January, we sat down with Dr Moirana for this interview.

Q: Congratulations Dr Moirana for this great achievement. How has your experience as an Rsif scholar shaped your academic journey and contributed to your success?

A: As an Rsif scholar, I have had the privilege of accessing numerous resources that have significantly shaped my academic journey. In addition to providing financial support for my PhD, Rsif organizes various training programmes aimed at enhancing our research, communication, and personal skills as future African leaders. These trainings and webinars have transformed the way I think and communicate with the world.

Importantly, Rsif scholars and alumni have access to the Junior Investigation Research Award (JIRA), which supports Rsif-sponsored PhD graduates in advancing their research careers after completing their degrees. It was through

page 8>>



Dr Ruth Lorivi Moirana holding the prestigious L'Oréal UNESCO Award For Women in Science Award 2024. PHOTO/COURTESY

<< from page 7

the JIRA that I was able to apply for and successfully obtain the L'Oréal-UNESCO For Women in Science award. Therefore, the JIRA serves as a seed that helps us attract further funding, and I am grateful to the visionaries behind the JIRA.

Q: Who have been your mentors or role models throughout your academic journey?

A: The mentors in my academic journey have always been my supervisors: Prof Kelvin Mtei, Prof Revocatus Machunda, and Dr Marcos Paradelo. They have been a significant source of motivation and have served as role models throughout my studies, continually encouraging me to strive for more. Although he was not my supervisor, Prof Mwemezi Rwiza has also been an important mentor, offering incredible support and promotion for my work. I am grateful to all of them.

Q: What is the core focus of your research, and why is it important?

A: My research investigates how fertilizers interact with “outlier soils.” Outlier soils are those that do not fit into typical soil classifications due to abnormal physical, chemical, and biological factors. These unique characteristics alter the conventional interactions between fertilizers, soils, and crops, thereby affecting the effectiveness of the fertilizers. My research aims are to establish these interactions, investigate how they influence nutrient availability for the grown crops, and design an appropriate treatment plan.

Q: How does your work address specific challenges facing your community or region?

A: Tanzania is located along the Great Rift Valley (GRV), which has both advantages and disadvantages. One significant drawback is the introduction of contaminants into the upper part of the Earth's crust, specifically the soil “Chemically contributed outlieriness”. One of these contaminants is fluoride, which impacts approximately six regions of the country.

Elevated fluoride levels in the soil affect how it interacts with fertilizer elements, leading to



either over- or underutilization of fertilizers, which in turn impacts their effectiveness. My research aims to ensure that farmers using fluoride-contaminated soils maximize the benefits of their fertilizers while also improving their soils' resilience to the impacts of climate change.

Q: Winning the L'Oréal-UNESCO for Women in Science award is a significant milestone. How do you feel this recognition will influence your future research and career?

A: Winning the L'Oréal-UNESCO For Women in Science award is a significant milestone for me for three main reasons related to my aspirations.

First, this award has provided financial support for my research, which is instrumental in building my career.

Second, like the Regional Scholarship and Innovation Fund (Rsif), it has given me a platform to showcase my work and gain attention from others. This visibility is essential for both my research and my personal growth.

Third, winning this award has validated my work, showing that it resonates with others

page 9>>

<< from page 8

and is easily understandable. The fact that there were 788 applications screened by 90 experts, with only 30 being selected as winners, highlights the importance of this recognition for me.

Q: What changes do you believe are necessary to improve gender equality in scientific fields?

A: I believe that we all have a role to play in bringing change to gender equality. This change starts with encouraging individuals who are passionate about pursuing science, building a supportive and open-minded society that respects individual choices and further, establishing a government that implements policies that promote gender equality in education, ensure equal representation in decision-making, and empower all individuals.

Q: As the first female Rsif scholar from NM-AIST to defend your thesis, what message do you hope to convey to other women pursuing careers in STEM?

A: Pursuing a career in STEM can be challenging for women due to various obstacles and barriers. However, I want to share these important messages with them:

1. Acknowledge your obstacles and factor them into your planning.
2. Create a detailed study plan that takes into account all potential challenges.
3. Commit to hard work and perseverance.
4. Cultivate a genuine passion for what you are doing.

By following these steps, you can navigate the challenges and thrive in your STEM journey.

Q: What are your aspirations moving forward and how does it align with Rsif goals?

A: I want to help empower Africa by contributing to clean and sustainable food systems. My goal is to ensure that farmers using contaminated soils have an equal opportunity to compete in the global food market in terms of quality.

To achieve this, I also aim to mentor my peers and the younger generation through teaching and supervision. This aligns with what Rsif implements through its mentorship and capacity-building programme, which pairs its alumni network with incoming new Rsif scholars with the solemn goal of fostering academic and research excellence

Q: How do you envision your research contributing to sustainable development in Africa?

A: Africa is a continent rich in natural resources and productive land. If we focus our efforts on agriculture, we have the potential to excel in global markets with our agricultural products. However, a significant number of farmers in Africa are smallholders who face various challenges that hinder their ability to produce high-quality goods for international competition. My research aims to support these smallholder farmers by addressing one of their key obstacles: the production of contamination-free agricultural goods.

Q: What message would you like to convey to potential donors about the importance of funding initiatives like Rsif?

A: I would like to express my heartfelt gratitude to the donors who chose to support initiatives like Rsif. Rsif is structured to make its opportunities accessible to deserving young people across Africa and motivated by the goal of driving change. Thus, the donors should know that they are investing in the future of a transformed Africa through the emergence of a new generation of transformative leaders.

Unlike many other initiatives, I appreciate that Rsif offers ongoing support to its scholars. I hope that Rsif will continue to support us— not just financially, which is important, but also by promoting our research to increase our visibility among those who share our language. Additionally, I would like to see more opportunities for networking and the enhancement of our skills through training whenever possible.

Unlocking Africa's Potential: A Call to Transform STEM for Global Impact



By Janet Otieno

Key experts from across Africa met in Ethiopia's capital, Addis Ababa, for a pivotal three-day conference to establish a strategic partnership aimed at transforming the continent's STEM ecosystem.

The event which took place in November 2024, organised by UNESCO and the African Union Commission, was aimed at tackling the root causes of challenges hindering STEM education, research, innovation, and entrepreneurship. It also aimed to develop effective strategies to unlock the continent's full development potential.

The conference's main agenda was built on the African Union's (AU) 2024 theme, "Educate an African fit for the 21st Century," which would forge a continent-wide strategic partnership to build a transformative science, technology, engineering

and mathematics (STEM) ecosystem.

According to UNESCO, Africa is poised for a transformative leap, driven by its youthful population—the largest in the world. With over 400 million youth aged 15 to 35, young Africans are projected to make up 42 per cent of the global youth population by 2030. This demographic dividend offers immense potential, but a significant skills gap poses a challenge. Millions of young people across the continent need essential STEM skills to thrive in the 21st-century workforce and drive sustainable development.

Speaking at the conference, Dr Julius Ecuru, Manager, Rsif Regional Coordination Unit, International Centre of Insect Physiology and Ecology (*icipe*) pointed out that Africa desires socioeconomic transformation to lift the majority of the people out of subsistence farming into the

page 11>>

<< from page 11

money economy and improve its human development index (including income levels from low to middle to high income status).

“Industry or private sector development is the driver, while scientific research and innovation is the engine. Building STEM capacity is crucial, and bridging skills gap in applied sciences & engineering are essential for growth,” Dr Ecuru emphasized, adding that we should act now and continue learning as we act.

He called for scaling of science and innovation initiatives and models that are already working, as we think of new ones besides collaborating regionally and internationally, even as we develop national science and innovation systems.

He also mentioned how this is being made real through Rsif by strengthening the institutional capacity for quality doctoral training, research, and innovation in transformative technologies in Sub-Saharan Africa.

“Through Rsif, we are creating a stock of highly skilled scientists, professionals, and innovators in ASET fields. Rsif is also addressing imbalances in the number of women and disadvantaged groups in ASET fields in Africa besides building African universities’ capacity to provide relevant PASET training,” Dr Ecuru stated.

Dr Emmanuel Efah, one of the Rsif Alumni in AI and machine learning, was also present at the conference. Dr Efah shared his inspiring story of how Rsif scholarship and support has raised him as an academic mentor, researcher, and innovator in Ghana. Dr Effah, who is also a senior lecturer at the University of Mines and Technology (UMaT), Tarkwa, Ghana, has been actively involved in capacity building in IoT, robotics, and AI for several students in his home country.

With such high-level discussions, Africans remain hopeful that such conferences would be catalyst for transformative action—one that mobilizes resources, fosters partnerships, and drives strategic investments in STEM. Now is the time to build an inclusive, dynamic STEM ecosystem that positions Africa as a global leader in research and innovation.

#Africa #ASET #Innovation



PASET has undoubtedly made a significant impact on our academic institutions. First, a direct impact on lecturers’ capacity building has been observed. We have also noted a direct effect on the capacity building of our PhD students. The scientific environment of the universities is indirectly enhanced through the Centres of Excellence. Thanks to the collaboration between PASET and these centres, we have outfitted our laboratories. This infrastructure enables our trained PhD students to access environments that meet international standards.

Prof Aminata Sall Diallo, Executive Director of PASET Executive Board,

Year in Pictures



Accelerating Inclusive Green Growth through Agri-based Digital Innovation in West Africa (AGriDI)

Theme: Skilling Up for Economic Empowerment.

Group photo at the Annual Implementers' Forum (AIF) 2024 for the Accelerating Inclusive Green Growth through Agri-based Digital Innovation in West Africa (AGriDI) project in Abuja, Nigeria hosted by The International Centre of Insect Physiology and Ecology (*icipe*), in collaboration with Agropolis Fondation (AF), Gearbox Pan African Network (GB), and Université d'Abomey-Calavi (UAC).



Agrifood Systems Symposium

Theme: Building Resilient Agrifood Systems and Climate Action in Mozambique.

Participants at the symposium organized by the International Centre of Insect Physiology and Ecology (*icipe*) serving as the Regional Coordination Unit of the Africa Regional Scholarship and Innovation Fund for Applied Sciences, Engineering, and Technology (Rsif) in collaboration with the University Eduardo Mondlane African Centre of Excellence in Agri-Food Systems and Nutrition.



World Bank visit: Ruth Charo (second right), Senior Education Specialist, World Bank, visited *icipe* and held discussions on fostering stronger collaborations in higher education and with *icipe* team: Dr Abdou Tenkouano, Director General *icipe* (second left), Dr Julius Ecuru (right), Head of Policy and Enabling Environment & Manager Rsif Regional Coordination Unit and Dr Everlyn Nguku (left), Head of Capacity Building and Institutional Development.

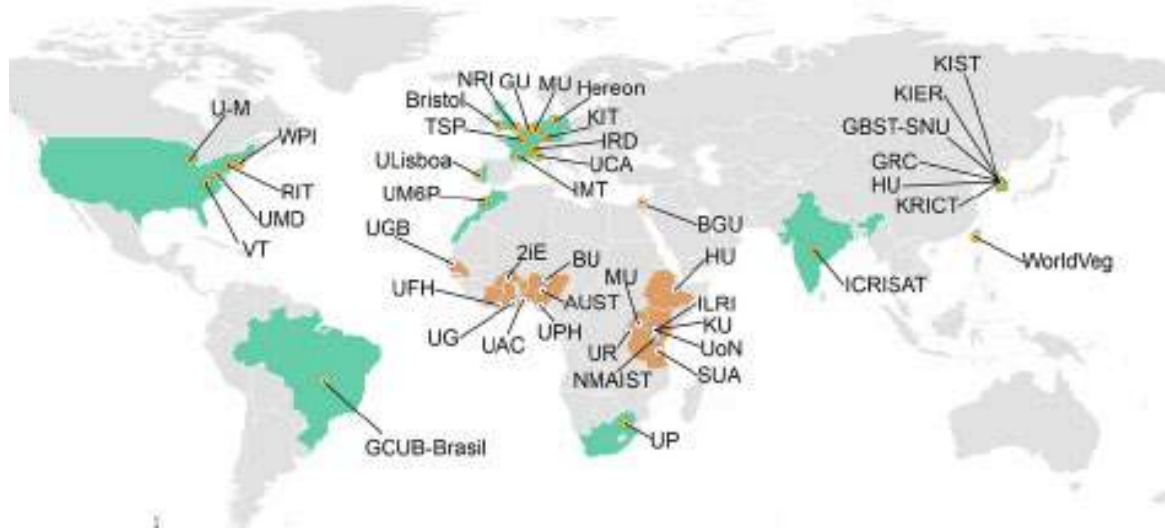


6th PASET Forum & Rsif Annual Conference From left to right: Dr Sunday Ekesi, Deputy Director General, Research and Partnerships at *icipe*, Prof Aminata Sall Diallo, Executive Director of PASET Executive Board, Prof Goolam Mohamedbhai, Cjair of PASET Consultative Advisory Group-CAG, Dr Miriam Altman, member of PASET Consultative Advisory Group and Eng Mike Hughes, PASET Executive Board Member.

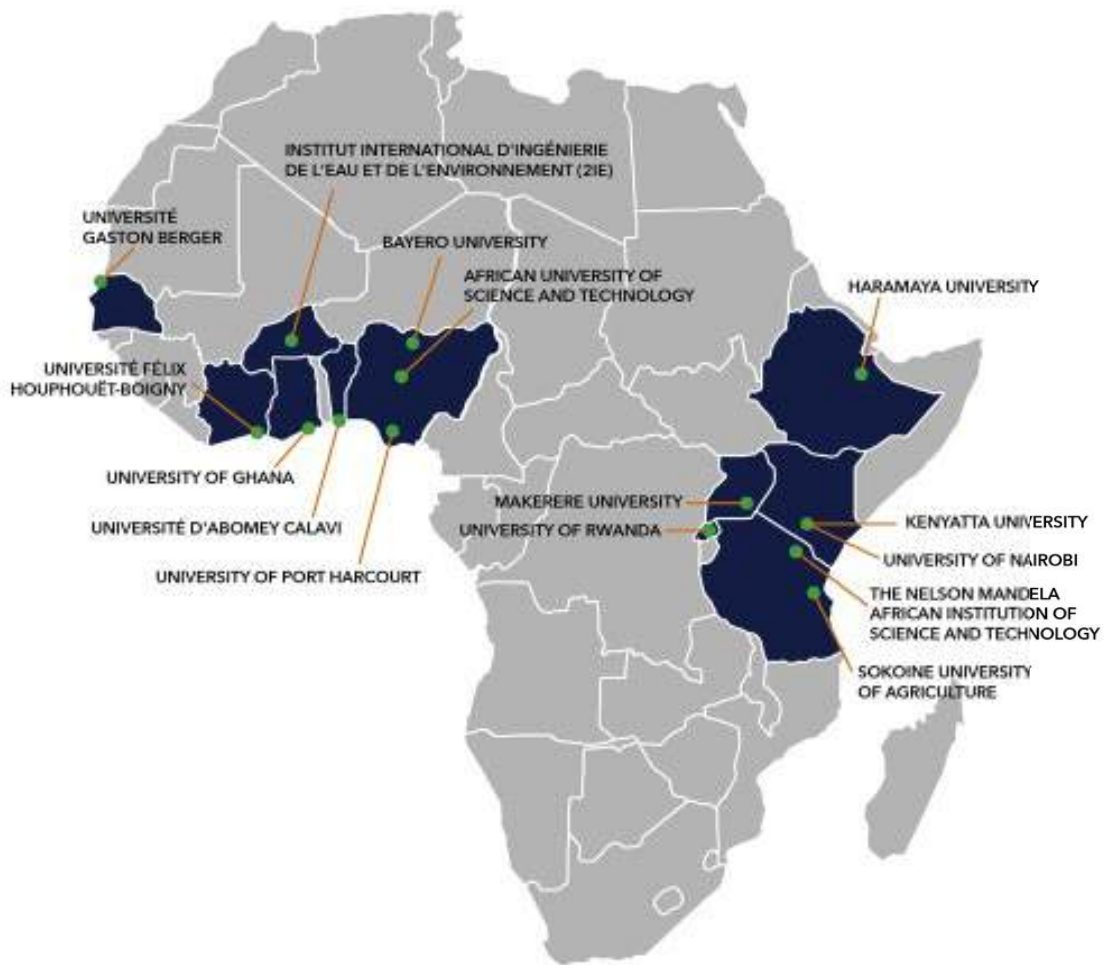


icipe Science Week: Eminent guests included Ms Alicia Sosa (4th left), First Secretary, Pan-Africa and Regional Development, Global Affairs Canada, and H.E. Mirko Giulietti (second right), the Swiss Ambassador to Kenya and Somalia, and also the Permanent Representative of Switzerland to the Office of the United Nations in Nairobi, pictured with representatives of the *icipe* Family.

Our Partners

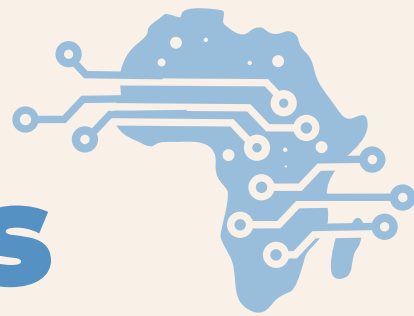


Rsis International Partner Institutions



Rsis African Host Universities

Emerging Technologies



Through the Rsif Research and Innovation Grant projects, technologies have been developed to address Africa's pressing development challenges and paving the way for transformative progress across the continent.

Mini Pilot Processing Plant for orange mesocarp processing for oil and gas

Prototype- Solar powered vaccine cooler AHU: University of Port Harcourt (Uniport)
Country: Nigeria



ICT and AI

2 IoT prototype devices developed Indoor air pollution monitoring, Smart Bee hiving
AHU: University of Rwanda

Sustainable water and energy

CDI Defluoridation prototype developed AHU: Nelson Mandela African Institution of Science and Technology (NM-AIST)

Country: Tanzania



Sustainable water and energy

Prototype- Solar powered vaccine cooler AHU: Nelson Mandela African Institution of Science and Technology (NM-AIST)

Country: Tanzania



Climate smart Agriculture:

2 Bio pesticides of plant origin for yam fungi registered.
AHU: Université Félix Houphouët-Boigny (UFHB) in Cote d'Ivoire



Bio pad, Sanitary towel from banana pseudo stem

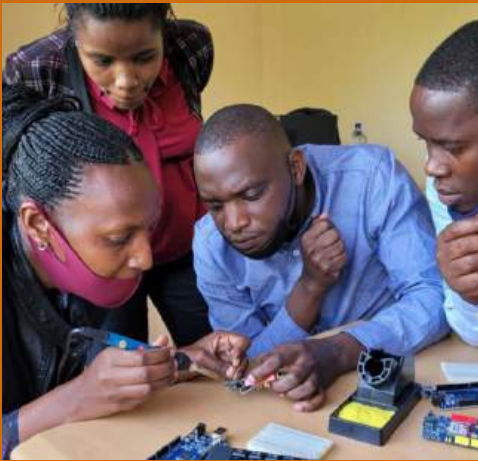
AHU: Kenyatta University

Country: Kenya



Capacity Strengthening:

546 faculty and scholars trained on innovation development and entrepreneurship



Food Security & Agribusiness Prototype:

Solar heat pump dryer

AHU: Nelson Mandela African Institution of Science and Technology (NM-AIST) Country: Tanzania



Food Security & Agribusiness

Prototype: Solar Assisted heat dryer for fruits and vegetables

AHU: Nelson Mandela African Institution of Science and Technology (NM-AIST)

Country: Tanzania



Voices of Impact

Testimonials from our scholars

By Sakina Mapenzi

The heart of Rsif lies in the stories of its scholars—visionaries transforming challenges into opportunities. Their testimonials highlight the profound impact of Rsif on their academic journeys, career aspirations, and contributions to science, technology, and innovation in Africa.

From groundbreaking research to inspiring leadership, these narratives showcase how Rsif empowers scholars to make a lasting difference in their communities and beyond. Dive into their stories and witness the ripple effect of investing in Africa's brightest minds.



**Esther
Aldégonde
Kpodo**

Climate Change



I was thrilled to be selected as a qualified female scholar within the Rsif program and admitted to one of the renowned African Host Universities (AHUs).

This opportunity has provided an exceptional learning environment, supported by high-quality courses and resources. My journey so far has been incredibly fulfilling and motivational.

Most importantly, as a female scholar, I feel empowered and valued, sharing equal opportunities with my peers, including leadership positions.

Rsif offers a unique platform to transform innovative ideas into impactful PhD projects, contributing to the socio-economic transformation of Africa. This experience has solidified my passion for research and my commitment to driving meaningful change across the continent.



**Dr Emmanuel
Effah**

*ICT, Big Data and
AI*



The PASET-Rsif scholarship came at a pivotal moment in my career, offering the chance to pursue a PhD in IoT-based smart technology—a field that aligns perfectly with Ghana's vision of building world-class capacities to drive its digitization agenda.

At a time when faculty members without PhDs faced the possibility of losing their roles, this scholarship not only preserved my career dreams but also positioned me to make meaningful contributions to teaching, research, and innovation. My goal is to return to Ghana and help shape Africa's digital transformation by advancing smart systems technology for the benefit of my country and the global community.



Dr Humphrey Andalo Mabwi
Food Security and Agribusiness



Joining academia as a teaching and research scientist has always been my dream. After completing my MSc in Molecular Biology & Biochemistry in China, I returned to Kenya and began working as a teaching and research assistant at Masinde Muliro University of Science and Technology. However, pursuing a PhD—a requirement for my role and a key milestone in my academic journey—seemed out of reach due to financial constraints.

In 2018, everything changed when I came across the PASET Rsif PhD Scholarship. Being selected as part of the first cohort of scholars was life-changing. The scholarship not only gave me the opportunity to pursue my dream but also provided access to resources and a support network that have enriched my academic journey. Rsif has made my aspirations of becoming a full-time academic and researcher a reality, and I am incredibly grateful for this transformative opportunity.



Dr Jeanne Pauline Munganyinka
Minerals, Mining and Material Engineering



As a young girl, I always dreamed of attaining a PhD, but I never thought I would have the financial means to achieve it.

The Rsif scholarship transformed my dream into reality, providing me with both the opportunity and the resources to advance my education. Being part of the first Rsif cohort in 2018 has been a life-changing journey.

My current sandwich program at Worcester Polytechnic Institute (WPI) in the United States has been a highlight of my academic career.

It has not only expanded my knowledge but also allowed me to unlearn, grow, and appreciate the differences in educational systems between my home country, Rwanda, and my host university in Nigeria. The experience has been invaluable in shaping my skills and perspectives, thanks to the foundation laid by Rsif.



Christelle Arielle Mbouteu
Energy and Renewables



In Africa, the shift to clean energy is more than a possibility—it's an imperative. With our abundant natural resources, we have the potential to achieve sustainable and accessible energy for all, paving the way for a greener, brighter future. I truly believe we can make it happen.

Thanks to Rsif, I received not just the funding I needed, but also access to high-tech equipment and software essential for my research. The program opened doors to present my work at both local and international conferences, collaborate with leading researchers, and publish in high-impact journals, greatly enhancing the credibility and visibility of my research.

Rsif Doctoral Training Impact



About 20 Rsif PhD scholars completed their dissertations this year, contributing to the Fund's vision to build a sustainable pan-African science base, while advancing global knowledge and scientific research that addresses critical challenges in Africa.

Selected examples:



Mwende Mbilo receiving the the 2023 L'Oréal-UNESCO For Women in Science Sub-Saharan Africa Award



Dr Sawadogo during his PhD Thesis Defense



Dr Bayuo receiving an award at the International Maji Scientific Conference 2023



Dr Moirana in the laboratory.

Rsif invites new partners across industry, academia, and government.
Please, reach out via the contact below.

Email: rsif@icipe.org
Website: www.rsif-paset.org



Get in touch!

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