REPUBLIC OF RWANDA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

ncst National Council for Science and Technology

Innovation in Motion: New Insights, Tools, Pathways to Inspire the Next Generation

NCST Quarterly Newsletter – Issue 018- October – December 2025

PREAMBLE: This 18th edition of the NCST Quarterly Newsletter showcases Rwanda's innovation journey in motion, highlighting key evidence, digital tools, and initiatives that strengthen the national innovation system and advance the country's transition toward a knowledge-based and sustainable economy. This issue presents key insights from the Rwanda Innovation Survey 2022-2024, updates on the Rwanda Research and Innovation Repository, and inspiring science communication initiatives that cultivate the next generation of innovators. It concludes with findings from NCST's Monitoring and Evaluation (M&E) field visits, illustrating how funded research and innovation activities are generating tangible socio-economic impact across national priority sectors.

INSIDE THIS ISSUE:

Hon. Minister of Education officiating the dissemination workshop of the Rwanda Innovation Survey

Book Launch by Patrick Nzabonimpa at Ste Bernedette Kamonyi

Dr. Marie Chantal inspiring students at GS Kacyiru through her personal journey in Science

Awardees of NCST RWANDA - NCST MALAWI collaborative grant scheme

Insights from the Rwanda Innovation Survey 2022-2024: Policy and Implementation Perspectives

Esperance Munganyinka[1], Didacienne Mukanyiligira[1], Louis Sibomana[1], Japhet Niyobuhungiro[1], Marie Chantal Cyulinyana[1], Theogene Kayumba[1], Sano Anselme[1], Innocent Ngaruye [2], Alfred Nsabimana[3], Patrick Rebero[4], and Eugene Mutimura[1]

[1]National Council for Science and Technology
[2] University of Rwanda
[3]Ministry of ICT & Innovation
[4]Private Sector Federation

1. Rwanda Innovation Ecosystem

Rwanda's ambition to harness the potential of science, technology, and innovation (STI) reflects a strategic recognition that knowledge is central to addressing socio-economic challenges. Research and innovation are key drivers of economic growth, competitiveness, and improved quality of life.

To this end, Rwanda is implementing a range of strategic initiatives to strengthen its National Innovation System (NIS), including the establishment of globally renowned universities and research institutions. The Government of Rwanda supports research and innovation through dedicated funding mechanisms such as the National Research and Innovation Fund (NRIF), the Rwanda Innovation Fund, and other complementary instruments. These initiatives aim to empower researchers and innovators to develop solutions to social, economic, and environmental challenges, enhance research productivity, stimulate innovation, and strengthen national competitiveness.

In addition, the Government approved the National Science, Technology, and Innovation (STI) Policy[1] in June 2020, which provides a strategic framework to guide national interventions in science, technology, research, and innovation toward building a knowledge-based economy. Ultimately, these efforts seek to enable innovations to scale, attract investment, and generate value through new products and services, thereby enhancing Rwanda's innovation performance and improving its standing in global innovation rankings.

2. Rwanda Innovation Survey

2.1. Background and Rationale

Innovation is globally recognized as a powerful engine for social and economic progress, benefiting individuals, businesses, and national economies alike. Rwanda's Vision 2050[2] reflects this understanding by placing innovation at the heart of the country's socio-economic transformation, with the ambition to become an upper-middle-income economy by 2035 and a high-income country by 2050.

A strong innovation ecosystem depends on key elements such as knowledge, supportive policies, investment, and infrastructure. To guide effective action, many countries rely on reliable indicators to track innovation performance and progress over time.

In this context, assessing the state of innovation in Rwanda became essential. The assessment aimed to generate evidence on innovation and technology activities, their processes, and the interactions among key actors across Government, Higher Education, Business Enterprises, and Private Non-Profit organizations. This evidence is critical for informed decision-making, strengthening the National Innovation System, and aligning efforts with Rwanda's long-term development goals.

NCST's Executive Secretary welcoming the audience

[1] Science, Technology and Innovation Policy June 2, 2020, https://www.ncst.gov.rw/index.php?eID=dumpFile&t=f&f=25653&token=d6f1aeb0bb872e3c6792c0e26ac9318b77b72b0e
[2] https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/REPORTS/National_Development_Planning_and_Research/Vision_2050/English-Vision_2050_Abridged_version_WEB_Final.pdf

While Rwanda has made steady progress, its performance in the Global Innovation Index has been limited by relatively low levels of mature innovation outputs. The National Innovation Report addresses this gap by providing improved measurement of innovation and its contribution to economic growth, sustainability, and inclusiveness.

Hon. Minister of Education officiating the dissemination workshop of the Rwanda Innovation Survey

Innovation statistics is therefore essential to support evidence-based policies and maximize the impact of past, ongoing, and future research and innovation investments. The findings offer valuable insights into how factors such as innovation expenditure, types of activities, and existing barriers interact to influence economic growth and the development of the national innovation system. To support this effort, the National Council for Science and Technology (NCST) conducted the first Rwanda Innovation Survey, covering the period 2022-2024. The survey report was officially disseminated during a workshop held on 4 November 2025 at the Kigali Convention Centre (KCC), marking an important milestone in strengthening Rwanda's evidence-based approach to advancing innovation, science, and technology for national development.

Group photo of the workshop participants together with Hon. Minister of Education

2.2. Objectives and insights of Innovation survey

The Rwanda Innovation Survey was guided by four specific objectives: to identify the types of innovation and related activities across the business enterprise, government, higher education, and private non-profit sectors; to quantify the proportional contribution of national expenditure allocated to different forms of innovation and innovation activities; to assess existing gaps and identify barriers to innovation and their impact on innovation performance; and to propose evidence-based strategies to strengthen, boost, and sustain national innovation growth. Some insights from the innovation survey are as follow:

INNOVATION INTENSITY

Business enterprises in Rwanda devotes less than 1% of their annual turnover to innovation activities. This low innovation intensity of **0.77%** (in comparison with 1-3% in developed countries) poses risks to long-term competitiveness, productivity, job creation and Rwanda's ambition to move up the value chain. There is a need to **strengthen financial and investment support for innovation growth including targeted incentives, financing and grant schemes** to encourage medium-sized and high-turnover firms.

HUMAN CAPACITY

The majority of workers engaged in innovation activities across four sectors namely Business, Government, Higher Education and PNP sector) (47.8%) had a high school, or TVET qualification or less. These findings highlight **the need for targeted skills development and promotion of youth talents** to create a more inclusive and effective innovation ecosystem capable of generating high-impact outcomes across sectors.

INNOVATION COMPETITIVENESS

Business sector motivation for innovation suggest that most Rwandan firms are pursuing innovation mainly as a strategy for productivity gains. The innovations created are of incremental in nature (i.e. increasing in the level of novelty) rather than

being highly globally competitive. Only 8.5% of new innovations reached the international markets, **and only 9.5% product innovations and 5.2% process innovations were new to international market.** This highlights that innovation in Rwanda is predominantly domestically driven. There is limited engagement to reach global and international markets. **Rwanda's innovation ecosystem shall benefit from improved expertise and partnerships between domestic and global academia and industry, as well as adoption of emerging technologies.**

MOST INNOVATIONS WERE SERVICE-RELATED

All institutions with innovations reported **over 85% as service-related economic activities, except business sector with 58.5% service-related activities.** These findings highlight low innovation activity in primary industries such as manufacturing to promote *"Made in Rwanda"* program. This hinders competitiveness and productivity in these areas. There is a need **to unlock innovation potential in primary industries** such as agriculture, forestry and fishery, utilities, mining and quarrying and others.

2.3. Perspectives for Rwanda's Innovation Future

Rwanda's Priorities and Interventions to ensure innovation growth for economic transformation should be implemented towards:

- **Boosting R&D funding and innovation intensity**: increase budget allocations and incentivize private sector investment in research and innovation
- **Fostering Academia-Industry collaboration**: encourage collaboration through innovation hubs, incubators, and joint research initiatives that align academic research priorities with business needs/demands
- **Enhancing human capital:** focus on practical, market-relevant skills
- **Improving innovation competitiveness:** support entrepreneurship, provide targeted support for startups, access to finance, mentorship, and regulatory reforms
- **M&E**: building robust systems to track innovation outcomes and adjust strategies
- **Capacity building**: Strengthening institutional and human capacity across. sectors

Granting Awards to the NCST Rwanda - NCST Malawi Collaborative Research and Innovation Grants

2.4. Honoring Innovation: NCST-RW/NCST-MW Collaborative Grant Awards

During the Innovation Survey dissemination workshop, the National Council for Science and Technology (NCST) had the honor and privilege of presiding over a Grant Award Ceremony recognizing outstanding efforts in advancing research, development, and regional collaboration. On this occasion, NCST awarded five competitive grants under the NCST-RW/NCST-MW/2024 Collaborative Research and Innovation Grants**,** a joint initiative between Rwanda and Malawi. The awarded projects focus on the application of Artificial Intelligence (AI) and the Internet of Things (IoT) in manufacturing processes**,** underscoring a shared commitment to driving industrial growth, strengthening innovation ecosystems, and fostering cross-border scientific collaboration.

2.5. Innovation Inspiring Talk

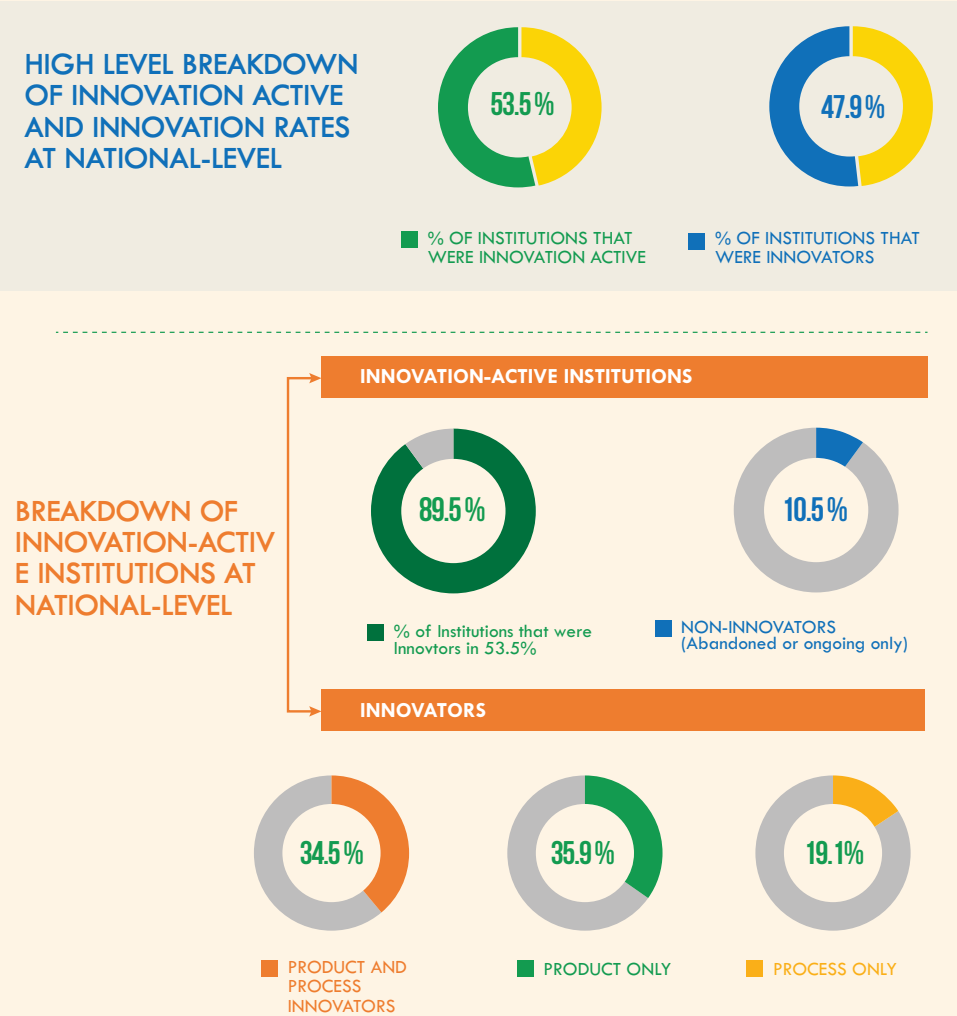
Dialogue with young innovators

In the afternoon session, emerging innovators and participants interested in understanding the state of innovation in Rwanda were offered a valuable opportunity to engage directly with two renowned Rwandan innovators. The session provided a platform for open dialogue, where the speakers shared their personal innovation journeys, highlighted key milestones and challenges, and offered practical insights on how young innovators can remain committed to research, creativity, and continuous innovation in their respective fields. The discussion featured Mr. Audace Niyonkuru, Chief Executive Officer of Digital Umuganda**,** and Ms. Niyigena Hawa**,** Chief Executive Officer of Whiz Upp Ltd, both of whom are recognized for their impactful contributions to Rwanda's innovation ecosystem. The session was expertly moderated by Ms. Enorah Gladis, a journalist from the Rwanda Broadcasting Agency (RBA)**,** who guided the conversation and facilitated meaningful interaction between the speakers and participants. Through this exchange, participants gained practical perspectives on leveraging innovation platforms, embracing collaboration, and sustaining a research-driven mindset to translate ideas into impactful and scalable solutions.

3. Conclusion

Rwanda Innovation Survey 2022-2024 reaffirm the country's strong commitment to building a dynamic, knowledge-driven economy anchored in science, technology, and innovation. While notable progress has been made particularly in strengthening institutions, expanding the innovation ecosystem, and promoting inclusive participation, key gaps remain in innovation intensity, human capital, and global competitiveness. Addressing these challenges will require sustained investment, stronger collaboration across sectors, and strategic alignment of national priorities with emerging technological opportunities. By building on the evidence generated through this survey, Rwanda is well positioned to refine its policies, accelerate high impact research and innovation, and advance toward its vision of becoming a knowledge based economy.

INNOVATION ACTIVE AND INNOVATION RATES



Status of development of Rwanda Research and Innovation Repository: User Acceptance Test (UAT) and Training

Louis Sibomana[1], Felly Kalisa[1], Marie Chantal Cyulinyana[1], Theogene Kayumba[1], Jean-Louis Niragire[1], and Damien Hanyurwimfura[2]

[1]National Council for Science and Teachnolgy (NCST)

[2]University of Rwanda, African Center of Excellence in Internet of Things (UR_ACEIoT)

1. Introduction

The National Council for Science and Technology (NCST) in collaboration with the University of Rwanda (UR) secured a grant to implement a project titled "*Strengthening Rwanda's Research and Innovation Ecosystem through Training, Coordination, and Collaboration*", funded by the Research and Innovation Systems for Africa (RISA fund, Kenya) program. The project is expected to contribute to the enhancement of National Innovation System (NIS) to enable effective technology and knowledge transfer that supports Rwanda's economy growth.

One of the specific objectives of the project is to develop Rwanda Research and Innovation Repository, a digital platform set to transform the storage, dissemination, and accessibility of research and innovation outputs in the country.

2. Background

To facilitate the development and implementation of the repository, the NCST in collaboration with UR, partnered with CSM Technologies Private Limited (CSM Techn) to develop Rwanda Research and Innovation Repository. Thereafter, a number of activities have been completed including user requirements workshop (on 26-28 February 2025) and prototype demonstration and testing workshop (04-08 August 2025), respectively organized by NCST with national stakeholders. Following the readiness of the developed repository by CSM Techn Ltd, the NCST in collaborations with national stakeholders hosted a 5 days' workshop on 10th-14th November 2025, for user acceptance test (UAT) and user training of the developed Rwanda Research and Innovation Repository. The UAT and user training workshop have been conducted on 10 -14 November 2025, and brought together key stakeholders, researchers, librarians, ICT specialists, policy-makers, editors, and system administrators.

NCST Team together with CSM Techn and Stakeholders group photo

3. Objectives and Expected Outcomes of the workshop

The purpose of the workshop was to conduct user acceptance test (UAT) of the developed Rwanda Research and Innovation Repository, and to train users (contributors, reviewers, administrators) on the use and operationalization of the repository, as well as document additional inputs and feedback for improvements, and assess Go-Live readiness.

The User Acceptance Testing (UAT) and user training aimed to ensure that the repository and related systems function effectively, securely, and meet user needs. Key objectives included validating system functionality and workflows, confirming a user-friendly interface and effective data management, and ensuring accurate search, discovery, and retrieval of datasets.

The process also assessed integration with external systems such as RIGMS, ORCID, and DOI services, verified notification mechanisms, access controls, and user permissions, and ensured data integrity, long-term preservation, and system performance under high demand.

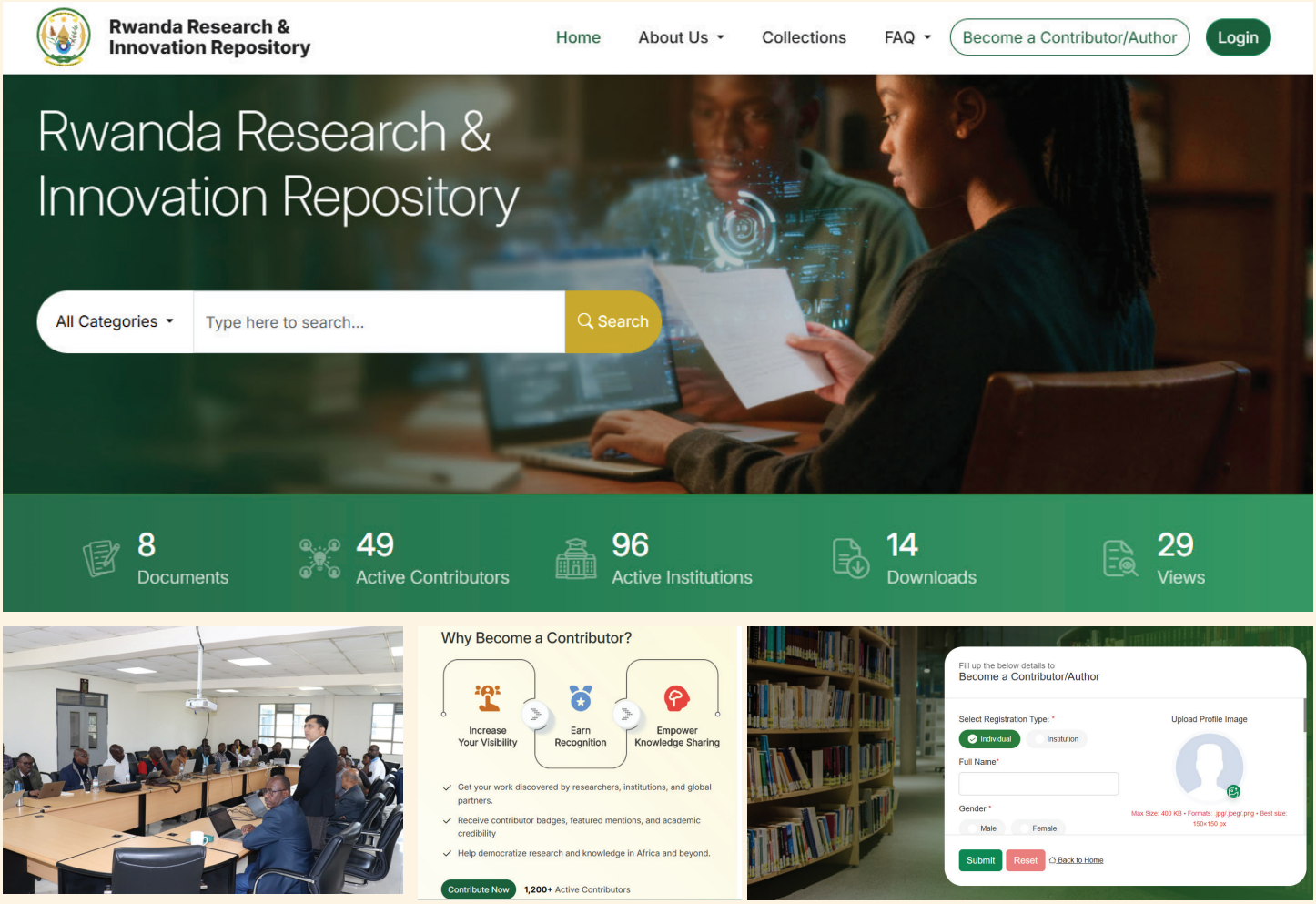
In addition, security, privacy, and compliance with national policies and legal frameworks were reviewed. User training focused on equipping participants with practical skills to use the repository efficiently, troubleshoot common issues, and support administrators in managing content and maintaining system sustainability. The exercise also included testing the upgraded version of the Research and Innovation Grant Management System (RIGMS).

4. Workshop approach and proceedings

The UAT and user training workshop brought together a diverse group of 40 participants, including researchers, innovators, technology developers, librarians, government representatives, policymakers, NCST staff, and ICT experts and system administrators.

The workshop used a participatory approach, including:

- Presentations from CSM Techn experts on the developed repository (accessible through: http://152.67.164.45/cms/Web/home)
- Group discussions, testing and practicing registration and upload of research outputs, gather inputs, feedback, comments and additional requirements from participants
- Technical sessions for addressing feedback and comments from participants
- Technical session to review and test the request of changes for the RIGMS upgrade



Rwanda Research and Innovation Repository

5. Key Recommendations and Next steps

After presentations, testing and practicing the repository functionalities and features, the five-day workshop resulted in the following key recommendations

5.1. Outcomes of the Workshop

The workshop successfully achieved its objectives and yielded several key outcomes.

- **Validated system:** The Rwanda Research and Innovation Repository (RRIR) was thoroughly tested and found to meet most of the user requirements, demonstrating robust functionality across core modules.
- **User Approval for Go-Live:** Stakeholders provisionally approved the platform for Go-Live, contingent upon the incorporation of the documented issues and recommendations.
- **Users Trained:** Participants acquired practical skills in using the repository, including submission workflows, review and approval processes, content management, and basic troubleshooting.
- **Documented Issues and Resolutions:** All technical issues, feedback, and recommendations were consolidated and shared with CSM Tech for resolution.
- **RIGMS Module Validated:** The upgraded RIGMS module was tested and approved, with only minor adjustments required to fully align with repository operations.

5.2. Way Forward

The next steps for finalizing and launching the RRIR include:

- CSM Techn will implement the required improvements and report progress within the agreed timeframe by 30 Nov 2025.
- NCST and the University of Rwanda will review and validate the fixes before Go-Live.
- User manuals, standard operating procedures (SOPs), and institutional rollout plans will be prepared.
- A pilot Go-Live will be conducted with selected institutions to ensure readiness.
- The official national launch will follow successful validation from the pilot phase.
- Long-term plans will address the establishment of a governance structure, development of a sustainable repository model, and continuous training and ongoing helpdesk support

Driving a Passion for Science: *"Mutoni: The Innovator of Kiruku"* Inspires Young Learners across Rwanda

Partick Nzabonimpa[1], Angelique Mbabazi[2], Nsengimana Sylvestre[3], Sano Anselme[4], Louis Sibomana[4], Marie Chantal Cyulinyana[4]

[1]The New times

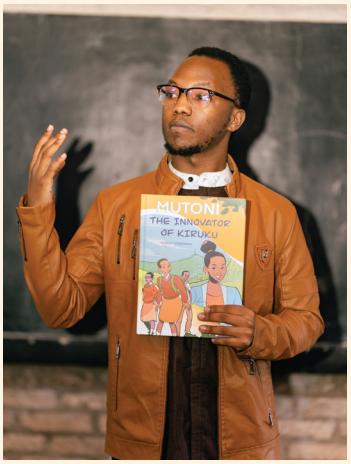
[2]Rwanda Association for Women in Science and Engineering (RAWISE)

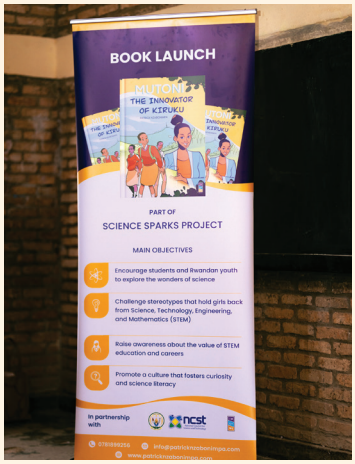
[3]UMUT ARTs

[4]National Council for science and Technology (NCST)

1. Introduction

In line with the National Council for Science and Technology's (NCST) mandate to promote a knowledge-based and innovation-driven society, NCST continues to champion initiatives that bring science closer to young Rwandans. One such initiative is *Mutoni: The Innovator of Kiruku*, a science-themed comic book developed by a journalist and author **Patrick Nzabonimpa**, the 2023 NCST Best Science, Technology and Innovation Communicator Award recipient. The book tour conducted in three secondary schools has sparked renewed enthusiasm for science and innovation among O'Level learners, particularly by connecting science to real-life challenges and future career pathways.



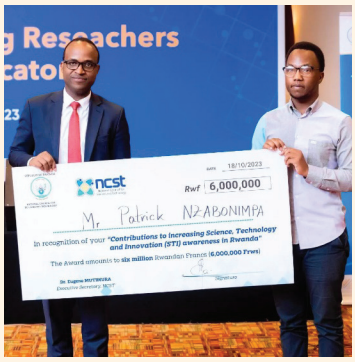


The book launch by the author Partick Nzabonimpa

2. Background: from award to action

In October 2023, NCST recognized **Patrick Nzabonimpa** fWor his outstanding contribution to raising awareness about science, technology and innovation (STI) in Rwanda[3]. Using part of his award, he created the *Mutoni: The Innovator of Kiruku* comic book, published by Imagine We Rwanda. Written in simple English and illustrated with engaging visuals, the comic introduces learners to scientific thinking, creativity, and problem-solving core skills needed for Rwanda's transition to a science-driven economy under Vision 2050.

Nzabonimpa launched the book and science outreach initiative in three schools: **Groupe Scolaire Kacyiru II**, **Lycée Saint Jérôme Janja** and **École Sainte Bernadette de Kamonyi.** The outreach forms part of his ongoing **Science Sparks Initiative**, designed to nurture curiosity, inspire innovation, and motivate students to embrace STEM disciplines.



NCST Best Science, Technology and Innovation Communicator Award recipient

3. Highlights from Schools Book Launch Events

3.1. Groupe Scolaire Kacyiru II Outreach (October 29, 2025)[4]

This was the first school, and in Kigali City, where the book was launched. The session included:

- Reading and discussion of selected pages from the comic book
- Student Q&A on innovation and scientific careers
- Inspirational messages encouraging girls to participate in STEM by Dr Marie Chantal Cyulinyana, Foresight Analysist at national Council for Science and Technology (NCST)
- A poetry performance integrating science and art by Nsengimana Sylvestre, poet and founder of UMUT Arts, a local performing arts company.

[3] https://www.newtimes.co.rw/article/11663/news/technology/the-new-times-reporter-wins-rwf6m-sciencetech-awareness-award

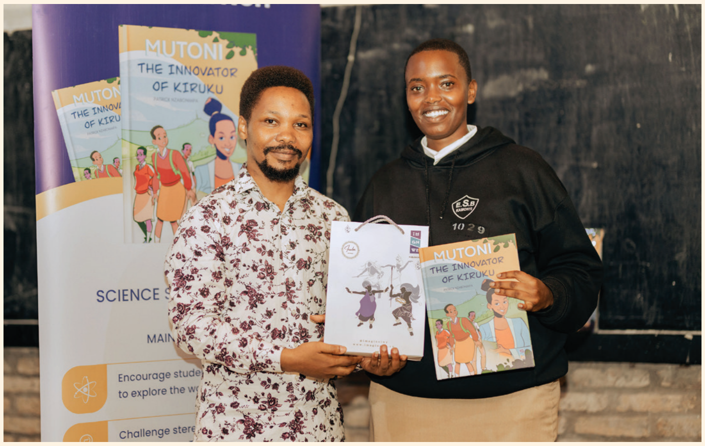
[4] https://www.newtimes.co.rw/article/30913/entertainment/art/new-comic-book-inspires-rwandan-students-to-embrace-science-innovation

The event left learners energized and motivated to pursue scientific curiosity in their studies. Sylvestre Nsengimana performed his poem *"Siyansi Yacu"* for the students, a piece celebrating the role of science in everyday's life and inspiring learners to embrace it with curiosity and innovation. He also shared reflections from his own journey, reminding students that creativity and science are not opposites, but partners. He encouraged them to stay curious, stay persistent, and dare to imagine solutions that don't exist yet. After his performance, he invited students to recite the poem in a friendly competition, and the top two participants received gifts.

NCST was represented by **Dr. Marie Chantal Cyulinyana**, Science and Technology Foresight Analyst. She engaged students in a lively conversation on how science impacts daily life and how STEM opens doors to vast career opportunities. Dr. Marie Chantal shared her journey with the students and they also got time to ask her curious questions. She emphasized on 5 things for them to be successful in STEM as a career. Driven by curiosity, discipline, innovation, and a strong problem-solving mindset, the future we aspire to build begins with the actions we take today. The event motivated learners and deepened their interest in pursuing science in their studies.

3.2. Launch Events at École Sainte Bernadette de Kamonyi

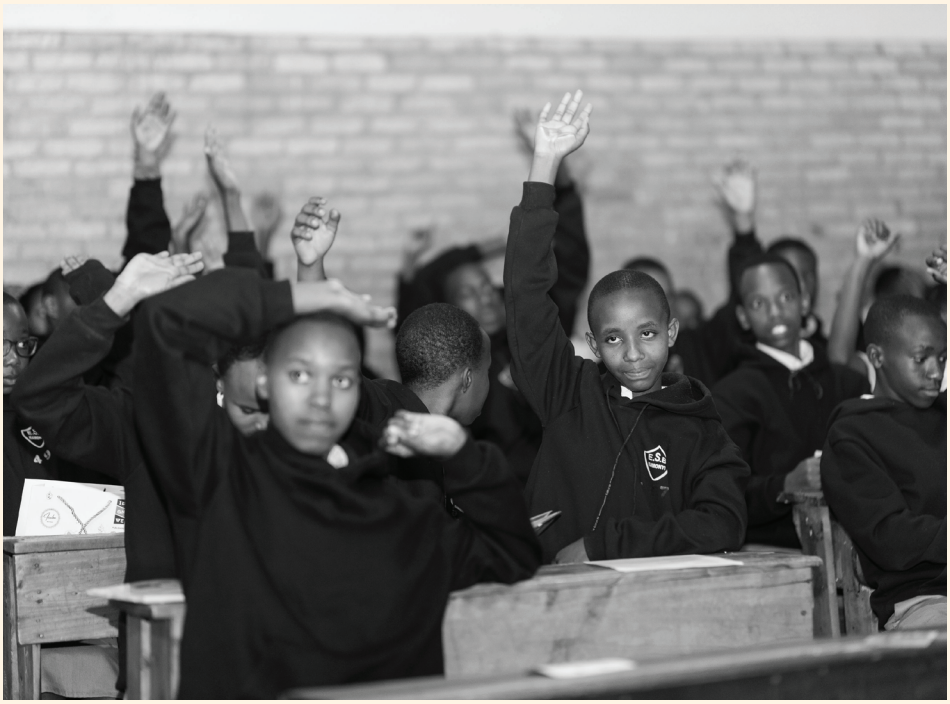
Similar activities were conducted, characterized by Welcome remarks from school leadership, Joint reading sessions, Awards for outstanding student engagement and Inspirational talks by the author, scientist/ Engineer Angélique **Mbabazi** from RAWISE[5], poet Nsengimana.



[5] Rwanda Association of Women in Science and Engineering

On 15th November 2025, **Angelique Mbabazi**, a Mechanical Engineer with a Master's degree, working as a Maintenance Planning Engineer at Rwanda Energy Group (REG), led a STEM outreach activity for secondary school students at **École Sainte Bernadette de Kamonyi** in Kamonyi District. The purpose of this engagement was to inspire young learners, especially girls to build interest and confidence in Science, Technology, Engineering, and Mathematics (STEM). The outreach was conducted alongside the introduction of *Mutoni: The Innovator of Kiruku*, a story that promotes resilience, creativity, hard work, teamwork, and the courage to pursue one's dreams. Angelique used the book as a motivational tool to encourage students to cultivate a reading culture, believe in their abilities, and appreciate learning as a continuous journey. During the session, Angelique shared insights from her academic and professional journey, highlighting how hard work, resilience, and teamwork contributed to her growth as an engineer addressing real challenges in Rwanda's energy sector. Her testimony helped students understand the real-life relevance of STEM and the diverse opportunities it creates. Students actively participated, asked insightful questions, and demonstrated strong enthusiasm for STEM-related subjects.

This outreach activity highlighted the value of early exposure and mentorship in nurturing future innovators. Angelique remains committed to supporting similar initiatives that empower young people across Rwanda to unlock their potential through STEM. Learners asked insightful questions about STEM pathways, and the speakers emphasized core success values such as curiosity, discipline, problem-solving, innovation, and making the most of available opportunities.



3.3. Book Launch at Lycée Saint Jérôme Janja (November 29,2025)

The school community welcomed the book launch with excitement. Headmaster **Fr. Protogène Hategekimana** appreciated the partnership, noting its role in strengthening students' interest in science and fostering creativity. Key activities included:

Author introduction message

Comprehension exercises, with top performers awarded

A science poem *Siyansi Yacu* performed by poet **Sylvestre Nsengimana**, followed by student recitations

A presentation by the school's science club on a smart-bell innovation, with detailed feedback from NCST

Student poem

Dr. Marie Chantal inspirational talk

Dr. Marie Chantal Cyulinyana delivered a compelling keynote on her academic journey from Rwanda to becoming the first Rwandan woman to earn a PhD in physics and encouraged students, especially girls, to pursue STEM fields with discipline and passion. Learners asked insightful questions about STEM pathways, and the speakers emphasized core success values such as curiosity, discipline, problem-solving, innovation, and making the most of available opportunities. These events demonstrated how storytelling, science communication, and youth engagement can transform learners' perception of science and encourage early interest in scientific careers.

4. Impact and Significance

The book launch and outreach program is bringing science to the grassroots particularly to O'Level students while strengthening the connection between scientific concepts and everyday challenges. It is also promoting gender equity in STEM, with many girls finding inspiration in female role models, and stimulating creativity in schools through student-led projects and active participation. Moreover, the initiative contributes to Rwanda's long-term ambition of building a research-driven economy supported by a skilled STEM workforce. The growing reach of the Science Sparks Initiative demonstrates promising potential for an even wider national impact.

5. Recommendations for the Government

To maximize the benefits of such grassroots science-promotion initiatives, the following recommendations are proposed:

Recommendations	Action
Strengthen National Science Outreach Programs	Establish a coordinated STI outreach framework under NCST to support innovators, educators, and science communicators in reaching more schools countrywide (NCST)
Integrate Science Communication in School Curricula	Encourage the inclusion of science storytelling, comics, and hands-on inquiry in teaching science, making STEM subjects more relatable and enjoyable for young learners (i.e. MINEDUC, REB)
Expand Support for Youth Innovation Clubs	Increase funding and mentorship for school science clubs through national competitions, incubation programs, and access to simple laboratory resources (I,e, MINEDUC)
Promote Female Role Models in STEM	Institutionalize programs that connect female scientists with schools to inspire girls and address gender gaps in STEM participation. (I.e. RAWISE, MINEDUC)
Support Local Creators Producing Educational Content	Provide grants, publishing support, and distribution channels for innovators and writers who are developing science-themed materials for children and youth. (PSF, NCST, ect)

6. Conclusion

The *Mutoni: The Innovator of Kiruku* school outreach initiative demonstrates the power of creative science communication in inspiring young minds. Through collaborative efforts between NCST, schools, artists, and scientists, Rwanda is nurturing a generation that is curious, innovative, and ready to contribute to national development. NCST remains committed to amplifying such initiatives and calls for continued support to ensure that every learner regardless of location has the opportunity to experience the transformative power of science.

Assessing Research Impact: Insights from NCST December 2025 M&E Field Visit

Elysee Uwimana[1], Jean Louis Niragire[1], Violette Mukamugema[1], Emmanuel Uwiringiyimana[1], Benjamin Nabaana[1], Chantal Cyulinyana[1], Didacienne Mukanyiligira[1], and Japhet Niyobuhungiro[1]

[1] National Council for Science and Technology

Introduction

In December 2025, the National Council for Science and Technology (NCST) conducted Monitoring and Evaluation (M&E) field visits to assess the progress and impact of research projects funded under its research and innovation grant schemes. The visits aimed to track project implementation, evaluate achievements against planned objectives, and document contributions to Rwanda's socio-economic development. Through direct engagement with research teams and on-site observations, NCST gained valuable insights into how funded projects are addressing national priorities in health, renewable energy, and sustainable agriculture. The visits highlighted the growing role of science, technology, and innovation in advancing food security, climate resilience, green industrialization, and community empowerment**,** reaffirming NCST's commitment to ensuring that publicly funded research delivers meaningful and sustainable impact.

This article highlights a few among several visited projects.

Enhancing the processing and standardization techniques towards the production of certified phytomedicines and food supplements in response to critical health needs in Rwanda

The project led by Mr. Andre Ndagijimana and hosted at National Industrial Research and Development Agency (NIRDA) to standardize the production process of selected and reputable phytomedicines and food supplements to meet international standards. Specifically, the project aims: (1) To identify and domesticate plant species for phytomedicines and food supplement development from local and available raw material. (2) To standardize the extraction process of Active fractions for phytomedicines and food supplements developments. (3) To standardize the production and quality control of phytomedicines and food supplements. (4) To initiate the products registrations, IP right, certification and awareness. Currently NIRDA and partners have entered a new phase towards commercialization of developed products. Construction of a production unit that meets Good Manufacturing Process and other health products requirements is underway.

Heating, Ventilation, Air Conditioning (HVAC) system outside the production unit under construction

Design and Construction of Efficient and Cost- Effective Solar Dryers for Low and medium size farmers and food processing enterprises in Rwanda

The primary goal of the project led by Mrs. Annoncee Mukeshimana and hosted at ULK Polytechnic Institute, is to ensure the adoption of solar drying technology in Rwanda. This entails leveraging scientific insights to develop optimized designs that prioritize high efficiency, affordability, and durability. These designs will be tailored to suit the specific needs of different regions within the country and the unique characteristics of various crop products.

This study aims to advocate for the implementation of in-house solar drying methods as an environmentally friendly approach to reducing postharvest losses, enhancing the quality of dried food, and lowering the overall expenses associated with post-harvest processing in Rwanda. More specifically, the project aims: (1) To determine current status of national crop drying needs and food drying conditions. (2) To design optimization models and Apps for solar crop driers. (3) To test and analyze performance data of designed solar crop driers in two different locations. (4) To build a prototype of a solar crop drier customized for specific environments and specific foods.

Greenhouse upgrades implemented at the Bugesera site, featuring prototypes made from different materials for option selection (left), and an improved greenhouse prototype constructed at the ULK–Gisozi site (right).

Currently, the project team has constructed an improved version of the solar dryer at ULK, prototype improved toward food-grade trays, and other key technical considerations including automated data collection system, overnight heating system, automated Temperature/ humidity control system. The future outlook of the project is to look for opportunities for commercialization.

IoT Empowered Precision Agricultural Techniques for Improved Rice Production: An Automated Irrigation and Fertilization Application System for Small-scale Rice Producers in Rwanda

The primary objective of the project led by Dr. Peace Bamurigire and hosted by University of Rwanda is to implement an automated irrigation and fertigation system based on real-time soil monitoring. Specifically, the project aims: (1) To assess the readiness of the rice farmers to use the IoT empowered irrigation and fertigation system for rice farming. (2) Investigate how control algorithms within an IoT water and fertilization Management system might be used for rice crop farming in Rwanda. (3) Design a mobile application and website, which will enable interfacing of the system and farmers.

The infrastructure required for automation has already been deployed, including a 250 m^3 water reservoir, which can support irrigation for up to two days, with six deployed 40-liter fertigation tanks. The system monitors seven agronomic parameters, including soil pH, moisture, temperature, nitrogen, and potassium to guide fertilizer application and optimize irrigation schedules. Controlled irrigation is currently performed twice per week, allowing improved water allocation compared to traditional methods and enabling better control of water consumption through coordinated release by scheme representatives. Conducted preliminary survey shows a positive impact on rice yields, with average production of 3 tons/ha, reaching 4 tons/ha sometimes. This performance surpasses that of neighboring farmers, demonstrating improved productivity due to optimized water usage and nutrient management. In addition, a prototype of the bird repelling system utilizing sound systems is already under development for integration into the system.

Photographs capturing key highlights from the field in Nyagatare

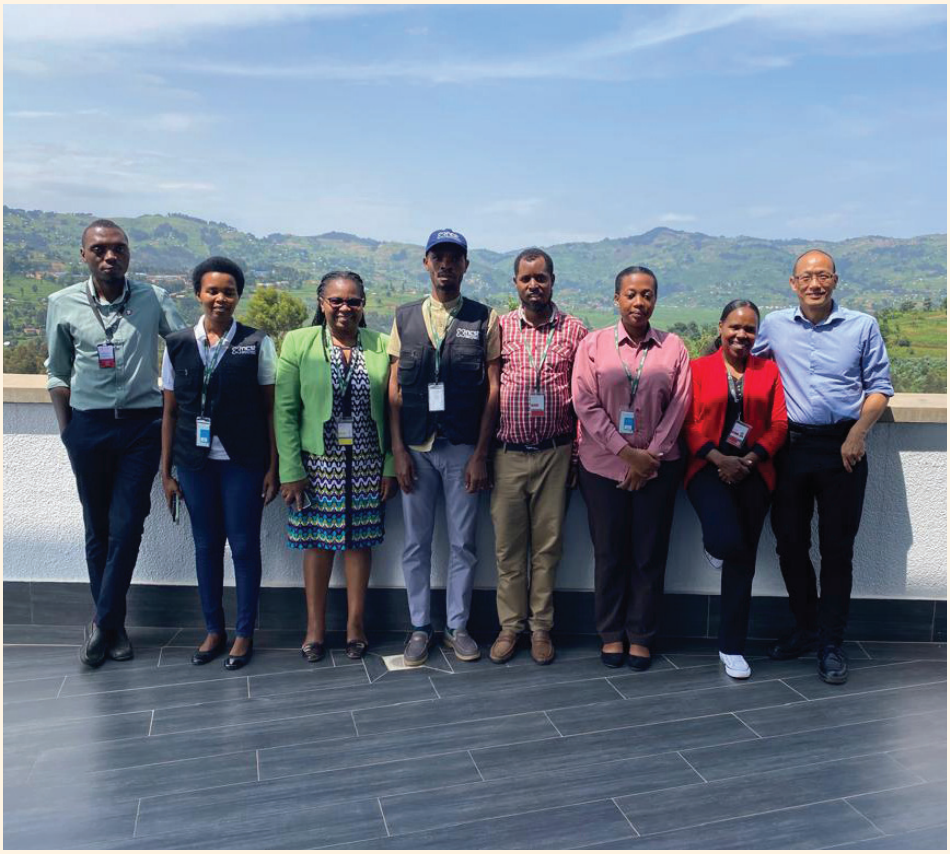
The project future outlook is to finalize the system and look for opportunities for scaling up for wider utilization across the country.

Design of community and health workers centered data collection systems for the health national adaptation

The project led by Dr. Maria Albin Qambayot and hosted by University of Global Health Equity (UGHE) aims to: (1) Map the intersections of climate and health through a comprehensive secondary literature review and data analysis. (2) Understand the vulnerability of communities to climate risks, and how health professionals understand and track climate-related health effects, including their data needs and existing gaps. (3) Co-create a robust set of health-specific vulnerability indicators and a multi-purpose M&E framework.

So far, the project team has completed

- Data collection from Community Health Workers (CHWs), Nurses/ doctors, District Veterinary Officers (DVOs) and Environmental Health Officers (EHOs) in five districts.
- Data collection on the community health professionals' knowledge and training needs on climate change and its effects on health.
- Scoping Review analysis



The future outlook of the project is to finalize and validate a set of health-specific vulnerability indicators and a multi-purpose M&E framework. This M&E framework has the potential for engaging communities, local health professionals, and stakeholders for community-based climate risk assessment and informing future health-focused National Adaptation Plan and climate vulnerability indices in Rwanda.

Conclusion

NCST's December 2025 M&E field visits underscored the transformative role of research and innovation in Rwanda's development agenda. From food and health systems to climate resilience and sustainable agriculture, these projects exemplify how strategic investments in STI generate tangible benefits for society. By bridging science and practice, they do not only advance national priorities under NST2 but also position Rwanda as a leader in harnessing homegrown innovation for sustainable development.