



# KOBWEB

Education | Technology | Empowerment



**2024  
Edition**

RENU's Community Magazine

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# Editorial

Welcome to the 2024 edition of Kobweb Magazine, a platform that captures the transformative narratives from Uganda's research and education community, and beyond. This year's theme, **Education, Technology, Empowerment**, is a testament to the synergistic relationship between these three pillars in driving societal progress.

In the articles that follow, you will encounter inspiring stories of innovation, resilience, and collaboration. From the revolutionary potential of AI in education to groundbreaking projects like the AfriChild Centre's inter-university programme, these narratives underscore the unyielding spirit of institutions, communities, and individuals working to shape a brighter future.

This edition delves deeply into the efforts to leverage technology as a catalyst for change. Whether it's the introduction of solar-powered routers to connect underserved communities, advancements in cybersecurity, or the transformative use of AI in agriculture and education, the articles demonstrate how technology can bridge gaps and create opportunities in ways previously unimaginable.

Equally compelling are the stories of empowerment, such as the journey of African Rural University, which is pioneering transformative education models tailored to rural development, or the impactful role of global coalitions in expanding access to higher education for refugees. These initiatives not only enhance skills and

knowledge but also foster hope, resilience, and self-reliance.

Education, Technology, and Empowerment are not isolated concepts but interconnected forces that drive sustainable development. Through this magazine, we celebrate the incredible strides made by Uganda's research and education community in harnessing these forces to address critical challenges and unlock new opportunities.

We hope this edition inspires you to contribute to the ongoing dialogue and actions that are reshaping our world. Together, let us continue to push the boundaries of possibility.

Enjoy the read!

*RENU*  
*Communications Team*





# Education





# DATA



## Improving Repository Infrastructure and Data Management in Uganda Universities

David Bukenya - University Librarian, Uganda Christian University/ Project Lead, Open Science Roadmap: Improving Repository Infrastructure and Data Management in Uganda Universities, and Jerry Sellanga - Engagement and Networks Coordinator, Invest in Open Infrastructure

According to a report by the Uganda National Council for Science and Technology (UNCST) in 2023, the output numbers of Ugandan research publications need to be higher for the size of the country, and many early career researchers need help accessing support and grants.

For the advancement of Ugandan research, there is a need to enhance the visibility of Ugandan research on the global stage as well as facilitate the sharing and discovery of Ugandan research outputs – including publications and data, to enable researchers worldwide to build on these outputs. Robust infrastructure, such as a repository, is critical for these purposes.

This is the motivation behind a repository upgrade project led by the Consortium of Uganda University Libraries (CUUL), an entity that strings

together university and research libraries to improve library services. This project, which is anticipated to run for two years (2024 - 2025), is an important step towards implementing the "Uganda Open Science Roadmap". The roadmap, established as a collaboration between CUUL and Electronic Information for Libraries (EIFL), focused on open science policy formulation and advancing research data management practices in the country. It led to the establishment of 15 open-access repositories in Uganda.

The current repository upgrade project aims to improve the robustness of Uganda's repositories and increase adoption. The project covers several complementary areas, including an assessment of the current repository infrastructure and data management practices in Ugandan university libraries, identifying universities and institutions without repository infrastructure and data management systems, needs

assessment of relevant stakeholders, including university administrators, librarians, and researchers to understand their needs and challenges, and data management training workshops.

CUUL received financial support of 12,760 USD from Invest in Open Infrastructure's (IOI) Open Infrastructure Fund for the repository upgrade project. The Open Infrastructure Fund was conceived as a pilot to test a community-driven, participatory funding model to strengthen sustainability and resilience, and increase the adoption of open infrastructure that underpins research and knowledge creation. The Open Infrastructure Fund aimed to provide catalytic funding for open infrastructure projects, specifically focusing on capacity building, strengthening community governance, and critical shared infrastructure.

To ensure that the Fund addressed community needs, the scope and pa-

rameters of the Fund were refined by running a public funding design survey and hosting conversations in Accra, Ghana and Buenos Aires, Argentina. 60% of the total funding available was reserved for individuals and organizations in Low and Middle-Income Economies (LMIEs) and/or services widely adopted by communities in LMIEs. Close to 200 applications were received following the public call for proposals. Ultimately, eight projects (including the CUUL project) were funded in Latin America, Africa, Asia, and Europe.

### Project Progress and Expected Impact of the Upgraded Infrastructure

The project activities commenced in April 2024 with the assessment of the state of repositories among CUUL member institutions. This allowed the project team to determine which institutions required upgrades, and those that didn't have and needed new installations. As a result, 10 institutions were selected to start with and are working with the CUUL technical team to complete the upgrades, while new installations are set to be completed by mid-November 2024. Thereafter, a technical workshop shall ensue on the platform before the end of November to train the IT personnel and repository managers on how to manage the platforms. The main challenge so far is the effective coordination of the IT teams in some institutions to provide infrastructure for the installations.

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It is more critical than ever that researchers in countries such as Uganda embrace open science practices to effectively participate in the global knowledge commons, to enable the local and global research communities to tackle urgent challenges...

Upon completion of the project, the improved repository infrastructure will be a catalyst for the advancement of research in Uganda. One of the most promising impacts will be the enhanced research visibility of Ugandan research on the global stage. With the establishment of modern, well-maintained repositories that researchers actively use, we can expect a significant increase in Uganda's research outputs' global visibility. The number of research outputs (e.g., publications and datasets) shared through the upgraded repositories and openly accessible to the public will serve as a testament to the initiative's success in improving research visibility.

Improved infrastructure and accompanying data management training workshops are critical to enhancing data-sharing practices and open science within the Ugandan context. Open science principles promote the free and open dissemination of research outputs, data, and scientific information, facilitating collaboration, reproducibility, and societal engagement in the research process. While technological growth, e.g. the broadening availability of the Internet, has enabled rapid sharing of information

and accelerated research, it is more critical than ever that researchers in countries such as Uganda embrace open science practices to effectively participate in the global knowledge commons, to enable the local and global research communities to tackle urgent challenges in areas such as climate, health, and food security. Uganda's development blueprint, Vision 2040 and National STI Policy stress that science, technology and innovation (STI) are fundamental pillars of the Ugandan economy. This was further boosted earlier in 2024 when the East African Community (EAC) regional STI Policy explicitly mentioned that open science is a key lever for the region's socio-economic transformation.

The Ugandan repositories that are being upgraded are on the open-source DSpace software. This not only means that the research community in Uganda can freely access, share, and build upon the knowledge stored in these repositories, but that they have control over how the knowledge is shared. Through the data management training workshops, a community of practice is also developed that will further help to advance and sustain open science practices within the country. The level of engagement and participation in workshops, seminars, and training sessions on repository management and data practices would indicate the success of efforts to build a community around open science.

For more information on the repository upgrading project, please visit the [CUUL website](#).





## Education that Works for the Community The Story of African Rural University

Interview with Prof. Mwalimu Musheshe

African Rural University (ARU) is a pioneering all-women institution in Uganda, dedicated to developing professional expertise in rural development. Established by the Uganda Rural Development and Training Programme (URDT), ARU's mission is to empower women to become transformative leaders and effective change agents within rural African communities. We had the privilege of meeting the Vice Chancellor of ARU to explore the circumstances that inspired the university's establishment, its unique model, and how the university is impacting rural development in Africa.

**Thank you so much for taking the time to speak to us today. Could you briefly introduce yourself to our audience?**

My name is Mwalimu Musheshe, Ashoka Fellow. I have a PhD in Global Environmental Leadership. I'm the first Ashoka Fellow in East Africa, 2001. Ashoka is an international organization that recognizes individuals who are social entrepreneurs, which means we are not doing enterprises with a profit motive, but we invest for the public. The organization is in Washington DC, and I was elected the first Ashoka Fellow in the region in recognition of my work as a social entrepreneur.

**You are a co-founder of the Uganda Rural Development and Training Program (URDT), which has made significant strides in community development. Could you share the story of this program?**

The story is a long one. I used to volunteer with an organization called Uganda Food and Peace Project. But after eight months, myself and some colleagues (Mr. Ephraim Rutaboba and Konstantin) discovered that there was rampant corruption, and we raised a red flag. Having been the most vocal leader, there was an attempt to kill me. I was hit with a hand grenade, and when that happened, the government

moved in and dissolved the Uganda Food and Peace Project. But then we sat down and asked ourselves, why should Uganda lose because of individuals who are greedy? That's why we requested the African Food and Peace Foundation, which was supporting the then Uganda Food and Peace Project, to allow us to continue with the principles we were using to run the organization at that time. And because the Foundation trusted us, they agreed to support us, but with a new organization we called Uganda Rural Development and Training Program (URDT). We also had to relocate from Kamwenge to Kagadi to ensure harmony and not conflict; by then, of course, Kagadi was a hard place to reach. Communication was very difficult, roads were very bad, and for us, that was exciting because we were going deep into the rural area to test our methodology. So, that's how URDT was born in 1987.

**How has URDT impacted the Kagadi community and the greater community over the years?**

When I look back and see how we found Kagadi, it was almost non-existent. Kagadi was found in Kibaale, which was part of Hoima District. Later, Kibaale was carved out of Hoima to make it a separate district. Eventually, Kagadi became a district in 2017 neighbouring Kibaale. But, our focus was originally not just on Kagadi. It was the greater Hoima District. In Hoima District, we worked closely with the United Nations Children's Fund (UNICEF), especially on projects related to water protection, to create more than 200 wells in the area. Before the government changed the policy about the forests, people were displaced from Mpokia Forest, and relocated to Kibaale, where URDT was requested to organize for their resettlement. Within a few years, we settled more than 200 families. We later came up with a program to assimilate the newcomers from Mpokia into the local community through the Integrated Rural Development Program, in which we introduced the principles of creating, organizing, sustainable agriculture, and water education. As we talk now, Kakumiro, and especially Kisita, Katikara, Mwitanzige, and Nkoko, are now a breadbasket of this area. The areas we found as mere

villages in the early 1990s have transformed into towns, some as big as Kagadi. So, the impact has been about changing the landscape in terms of farming, education, water and health.

**Regarding education,** we established several schools in Kibale and Kagadi and set up a unique model for them. There are also other schools here in Kagadi, which we have transformed. The model is mainly geared towards uplifting girls. We get children (one girl from a family), bring them on campus together with her parents, and set parameters for identifying the poverty indicators. We train them in what we call the two-generation approach, where we teach both the children and their parents or guardians to do transformation activities. I can tell you that more than 1,000 students and homes have been transformed from abject poverty to what we call modern, thriving homesteads and families. The education and the dropout rate of girls and boys were about 44% and 32%, respectively, but through this model, we gave impetus to education, and people started taking real education very seriously. We also started seeing a very big movement of parents from hinterland villages bringing their children to these schools because we set an example of what it is to have a girl child in school and transform the households.

**Regarding Agriculture,** we noticed the income generated by the farmers was very low which motivated us to introduce what we call nutrition-based agriculture which promoted supplementing maize farming with other vegetable growing. A remarkable story is when we introduced watermelon, and people went and cooked them thinking they were a type of pumpkin. This initiative greatly improved the locals' income and nutrition in the region that was initially dominated by maize growing.

**For the youth,** we established an institute where we are teaching vocational skills and youth leadership in 20 districts using the satellite model. In the satellite model, we identify other people in the communities who have the same skills and interests and partner with them to train the youth locally from their villages. As we talk now, with

the support of the Mastercard Foundation, we have trained 57,000 young people, 70% of whom are women, and about 34,000 have transitioned into business and formal employment. We are also working in four refugee settlements. To achieve this, we are working with about 700 artisans. So, now you can imagine an area of 20 districts to have about 700 vocational learning centers managed by the communities and supervised by the communities. This has been one way to deal with the issues of employability and socioeconomic empowerment.

**I noticed the presence of a radio station here. What inspired you to establish this station?**

The story of how it began is quite interesting. It started with our participation in the Rio de Janeiro Earth Summit in 1992, where global leaders were discussing environmental issues like climate change, desertification, and marine conservation. We observed that many resolutions passed at such conferences often ended up gathering dust when the leaders returned home. So, when we came back, we joined forces with counterparts from Tanzania, led by Amaga Demasai, and from Kenya, under the leadership of EcoNews Africa and Climate Africa. Together, we conceived the idea of community radio stations as a tool for advocacy, leadership, and environmental awareness. That's how Kagadi Kibaale Community Radio (KKCR) was born, alongside two other community stations—one in Terratis, Manjaro in Tanzania, led by Amaga Demasai, and another in Ukambani, Kibweni, Kenya run by 11 women's groups. For many years, from its inception in 2000 until recently, KKCR was the only community radio station in the region. The radio reaches more than 2 million listeners daily. We have also conducted surveys and gathered testimonies from people who attribute their business success to the influence of KKCR.



From our interaction, you talked about the visionary approach. Can you highlight how the approach is assisting URDT realize its transformation goal in the community?

I was planning to discuss this in relation to the African Rural University, specifically how we apply our methodology through epicentre managers, outreach programs, and community engagement. We use a system called 'creating and systems thinking,' which shifts the focus away from simply asking people about their problems—because they already know them. Instead, we encourage people to talk about the future they envision. This is why I believe we were pioneers in introducing the principle of a visionary approach in a meaningful way, something we've been using since the 1980s. The essence of this approach is to sit with individuals or communities and guide them in creating a mental picture of the future they want—whether in 3 months, 5 years, or even 20 years from now. Once they have this vision, we ask them to reflect on their current reality and assess the gap between where they are and where they want to be. This creates a clear path of what needs to be done to move from their present state toward achieving their desired future. Unlike traditional problem-solving, where action is driven by the urgency or magnitude of the problem, the visionary approach is proactive. It's not about reacting to problems but about actively creating the future they want to bring to life. This shift in focus—from solving problems to creating desired outcomes—is why we call it the visionary approach.

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**While we are an all-women university, our approach is about more than gender. It's about the holistic package we offer—combining learning, research, community engagement, and development interventions...**

When we first discussed establishing a university in 1987, the government had not even considered reforming higher education. In fact, it wasn't until 1991 that they created the National Council for Higher Education (NCHE). So, we were already ahead of our time by more than five years when it came to envisioning what development should look like and how people could take control of their own growth.



A student tilling her plot of land within the university campus.

**ARU is an all-women's university, the only of its kind in Uganda and one of the very few in Africa. What motivated you to start this university?**

The same motivation that led us to establish the Uganda Rural Development and Training Program is reflected in our motto: Human and Rural Development. Over the years, in regions like Karamoja, Turkana, Ethiopia, Eritrea, and beyond, we witnessed a recurring cycle of famine every decade. Each time, the global response was reactive—providing aid, after which complacency set in, only for another crisis to emerge later. We believed there had to be a more consistent approach, one that encouraged people to keep progressing. Instead of waiting for the next disaster, we wanted communities to continuously assess their achievements and ask, 'What have we accomplished? What's the next challenge we need to address?' When we came here, this philosophy guided our actions. In fact, if you look at our 1987 constitution, particularly objective N, it clearly outlines our vision: establishing a university focused on empowering people to shift from a reactive to a proactive mindset.

This brings us to the concept of the African Rural University for Women. As I mentioned, when we arrived here, we had to demonstrate our methodology in the communities—focusing on self-help, self-organization, and self-reliance. It worked, but at that time, we couldn't start a university because the dropout rate was too high, and the legal framework hadn't been established by the government. Once the government created that space, we asked ourselves, 'What kind of education for development do we want to create?' And more importantly, 'Who are the best agents for this? As a women's university, our mission wasn't born from a need to fulfil affirmative action quotas. Instead, we asked fundamental questions: Who are the best teachers, managers, multitaskers, peacekeepers, and negotiators at the household level? We found that women excel in these roles.

While men can be more mechanistic in their approach to life, women display resilience, patience, and problem-solving skills. Women are the ones guiding their children, managing the household, and resolving conflicts. We realized that empowering women to take charge of the development process would lead to faster, more sustainable results.

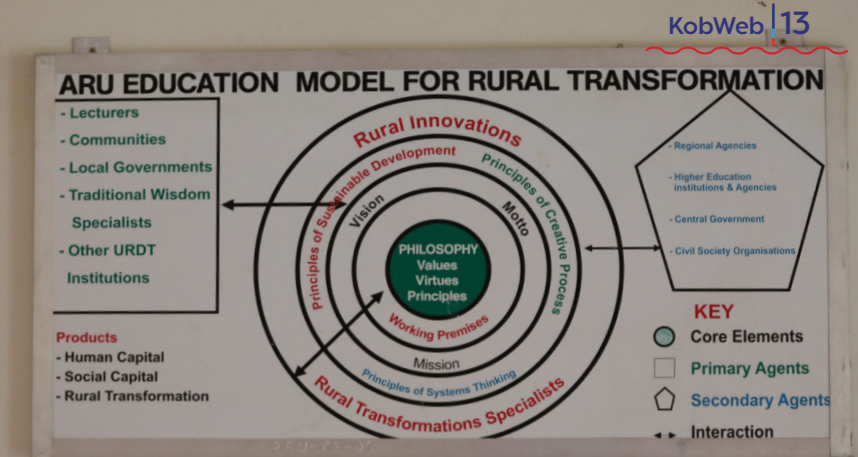
Additionally, we recognized that if women, who are already doing much of the work, were given the tools for research and access to resources, they could transform households. In families where women are in charge, all children are more likely to attend school than in situations where limited resources often prioritize boys. This balanced approach benefits the entire family.

Lastly, our research on the role of religion in education showed that missionaries were strategic in starting both boys' and girls' schools. The girls' schools focused not just on religious education but on shaping women as promoters of faith in their families. Our research confirmed that children often follow their mother's faith when she is strong in her beliefs. So, if we empowered women to understand rural transformation and development, and instilled in them the values of change, they would become powerful agents for both their own families and their communities. This is why the African Rural University exists for women—because women are the best change-makers, both in their personal lives and as leaders in their communities.

**Besides the university being an all-women institution, what is so distinctive about the university's education model?**

We are one of the few universities that not only talk about our model but also visually represent it. If you visit our campus lobby, you'll find a graphical depiction of the African Rural University model. At its core, African Rural University is a value-based, all-women institution. But what does value-based really mean? At the center of our model is the cultivation and practice of values. While there are countless values we could emphasize, we've chosen five or six fundamental ones, and we've placed them in an economic context for example, in the banking world, collateral is needed because there's a lack of trust. But in our philosophy, trust is a key value that drives our work. However, trust doesn't exist in isolation—it's built on integrity, honesty, compassion, empathy, and love. These values guide how we design our training programs.

Beyond values, we also have guiding principles. The first principle is that the people of Uganda, like people everywhere, are the key to their own development. We believe in self-reliance; others can support us, but the lead must come from within. The second principle is that when people share a common vision, they can transcend traditional prejudices such as tribal, religious, political, and gender divides to work together for a collective goal. Non-sectarianism and unity are central to our approach.



African Rural University's education model.

tion of reacting to problems. Instead, we aim to help people shift from being reactive to being proactive, taking control of their own future. This mindset is the foundation of sustainable development. We recognize that people already possess the wisdom, intelligence, and capacity to create change. Education, of course, plays a vital role in all of this. However, we emphasize transformative education, which goes beyond conventional learning. At African Rural University, we have developed a curriculum in collaboration with the communities we serve. We sit down with community members and ask, 'What should your young women learn?' This approach ensures that our education is rooted in the African context, not a mere imitation of Western models. We've also incorporated traditional wisdom specialists into our faculty—people who hold deep knowledge of our culture, traditions, and sustainable practices. While we avoid harmful traditions, we embrace those that have helped us manage our environment, relationships, and health, including ethnomedicine. Furthermore, we ensure that at least 40% of our students' education is practical. We pioneered the idea of blending vocational elements with university education—something that initially met resistance but is now widely accepted. Today, many institutions talk about making university education more practical, but we were among the first to lead this change. Our students don't just learn theory; they apply it immediately in real-world settings. Community engagement is another cornerstone of our approach. We don't see communities as something 'out there.' We have a community of students, staff, and workers right here on campus. Every morning, we engage in discussions that range from current events to pol-

itics and history—topics you won't find in textbooks.

Lastly, while we are an all-women university, our approach is about more than gender. It's about the holistic package we offer—combining learning, research, community engagement, and development interventions. We focus on creating a few well-coached, well-mentored leaders, prioritizing quality over quantity. This is what makes African Rural University truly unique in higher education.

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**Our partnership with RENU has greatly improved our connectivity, enhancing our learning and knowledge systems. This benefit extends to not only our staff and students but also the partners who engage with us.**

**ARU has been an esteemed member of RENU for some time now, and we would like to know how RENU has supported the university in achieving its vision over the years.**

ARU has been a proud member of RENU for several years, and RENU has played a significant role in supporting the university's vision, especially in this era where ICT is essential. Access to the Internet is now a fundamental need for teaching, research, learning, and engagement. Our partnership with RENU has greatly improved our connectivity, enhancing our learning



and knowledge management systems. This benefit extends to not only our staff and students but also the partners who engage with us. The constant flow of information and network access has kept conversations and learning dynamics ongoing, which has been invaluable to the university.

Additionally, RENU's support goes beyond providing network services. They emphasize the human aspect of service delivery. Unlike commercial providers whose primary focus is profit, RENU has engaged with us to build our capacity over time. Our staff, particularly in administration and ICT, have benefited from workshops and meetings facilitated by RENU, which have helped us grow and adapt to evolving technological needs.

Furthermore, RENU's approach to customer service stands out. They not only provide the network infrastructure but also take the time to check in with us regularly, whether through visits or feedback sessions, to ensure the system is working effectively.

This level of engagement—through monitoring, updates, and capacity building has created a strong partnership that feels more like a collaboration than a typical service provider relationship. For ARU, the support from RENU has been crucial in advancing our mission.



Center for reflection and development.

### In your view, what are some of the biggest challenges facing the education sector today and how would you propose that these challenges are addressed?

The first challenge we face is asking, 'Higher education for what purpose?' Answering this question can change how we invest in education, both in Uganda and across Africa. Many people focus on finances, asking how we fund small programs with few students. But it's not just about money—it's about the quality of graduates and their ideological and philosophical output for example, the government's flagship Parish Development Model (PDM) aims to eliminate poverty. How is higher education helping implement such transformative programs? Unfortunately, many universities remain disconnected from national and community needs, focusing on traditional academic programs that don't align with current realities. We hear a lot about training for the 'job market,' but that assumes a robust industrial base, which doesn't always exist. As a result, even graduates in fields like agriculture and environmental science often seek urban jobs rather than working in rural communities where they are needed most. In other parts of the world, like the U.S. at the Kennedy School or MIT, or China and South Korea, universities are deeply involved in national development agendas. They align their research, training, and outreach to support the country's strategic goals. In Uganda, there's a gap between what universities teach and the pressing issues facing the nation, such as economic transformation, agriculture, and resource management. We aim to bridge this gap at African Rural University (ARU). We engage deeply with the youth, focusing on sectors critical to national development—agriculture, tourism, and construction. Our graduates, whom we call 'barefoot soldiers,' are hands-on, working in communities, often using bicycles or walking to reach the people they serve. This grassroots engagement helps break the stereotype that education is just for 'white-collar' jobs.

Another challenge in our education system is continuity. In many countries, children are introduced to real-life skills early on, even in nursery school. Here, we often wait until much later to teach practical skills. By the time students reach university, they're unfamiliar with interdisciplinary learning, which combines science, technology, humanities,

and more. This disconnection makes it harder for students to adapt to the modern world, which requires a blend of practical and theoretical knowledge. ARU takes a different approach. We limit student numbers to provide a balanced mix of theory and practical learning. Our curriculum is designed with the community in mind, and when students graduate, they don't just seek jobs—they are employed by our mother organization or serve their communities directly. This reflects the spirit of Ubuntu, self-reliance, and service to the broader community.

Ultimately, higher education should not just be about personal or family survival but about building a foundation for future generations. As a nation, after almost 60 years of independence, we're still grappling with poverty despite our rich natural and human resources. This is where universities must step up, helping to create meaningful work and providing solutions that serve the greater good. The challenge for higher education and the entire education system is to create graduates who don't despise work but who create work and serve the nation.

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Our curriculum is designed with the community in mind, and when students graduate, they don't just seek jobs—they are employed by our mother organization or serve their communities directly. This reflects the spirit of Ubuntu, self-reliance, and service to the broader community.”

### What do you think RENU could do to enhance the future of education in Uganda?

I believe we need to elevate our approach. While we're talking about connectivity and Internet platforms, the technological landscape is rapidly evolving. I vividly recall visiting Boston in 1998 and witnessing some of the pioneering work being done in robotics at the time. At the time, it was astonishing—something that seemed futuristic. Now, robotics has become integral to many industries. But as we talk about robotics and new uses of ICT, we're being overwhelmed by the advancements in ICT itself. Robotics is, at its core, driven by ICT. So, when new technological developments appear, they shouldn't catch us

off guard—they're part of an ongoing evolution that we've been experiencing for a while. Yet, because we haven't paid enough attention, we often react as if these advancements are completely novel. For instance, even early computers had forms of intelligence, like self-correcting functions when you typed. It wasn't natural intelligence, but it showed the early potential of what was coming. Now, the question is, how is RENU addressing these evolving technologies and fostering meaningful conversations with its partners? Are we asking where we stand in relation to these advancements? What areas are we excelling in, and where do we need improvement? How can we collaborate to make progress? As the world changes in terms of social organization, politics, climate, and international relationships, these are the conversations we should be having.

Take, for example, regional and global initiatives like the East African Community, the African Union, Uganda's Vision 2040, and the African Agenda 2063. The technologies required to drive these agendas will differ significantly from what we have today. RENU has a crucial role to play—not only in research but also in fostering collaboration with partners to develop new programs, identify each other's strengths, and create strategic partnerships. RENU has tremendous potential to lead in shaping the future by driving research and innovation in collaboration with its partners, positioning everyone to stay ahead of these transformative changes.

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We want to highlight the importance of maintaining ecosystems. If forests lose their natural inhabitants like monkeys, birds, and chimpanzees, they can no longer thrive. These animals play a crucial role in forest regeneration, and without them, the ecosystem suffers. This project goes beyond financial gain; it's about sustaining the environment and our natural heritage. In summary, our focus is on bringing innovative solutions to communities in a sustainable, inclusive way, from technology and agriculture to tourism and environmental conservation.”

### Lastly, could you share with us any upcoming projects for your community and the broader academic community?

A lot is happening here. We're integrating advanced technologies into our operations, including working with a group of young boys who have started a cyber school. The goal is to bring technology, especially ICT, to the communities, which is crucial in transforming sectors like agriculture. For example, when we talk about sustainable agriculture, it's not just about cultivation but the entire value chain. How are we enabling communities to benefit from this?

I already mentioned that we also have a radio station, and now we've started streaming on YouTube and have launched KKC Television. However, the challenge is accessibility—how many people can actually access these platforms? Is it only for the elite, or can the wider community benefit? When we started the radio station, very few people had radios. So, we organized listeners into clubs and introduced affordable radio sets with the help of partners like Radio Farm International. This made it possible for more people to engage. Now, with television, we are aiming for a similar approach—making it accessible not just on regular TV but also through streaming on smartphones, like how we access YouTube.

We're also active in 20 districts, with plans to train 70,000 youth by the end of the year. While that's significant, it's still just scratching the surface, considering the size of the youth population in the country. We are gathering evidence that our methodology works, and with that, we aim to have meaningful conversations with partners like the MasterCard Foundation and even the government to show them how we are achieving results in a more cost-effective way compared to government-led regional hubs. We are also exploring innovation and incubation by bringing together creative minds. For instance, instead of sticking to old designs and fabrics in tailoring, we're encouraging the youth to be innovative with new styles and fashions that reflect modern tastes. This is part of moving from a static model to a dynamic one.

In terms of upcoming projects, we are focusing on three key areas. The first is economics, where we are introducing the concept of the 'care economy'—a system where goods and services are exchanged without money. We are piloting a community voucher system, which will allow people to trade services and products even without cash. This system builds on traditional methods of exchange, such as bartering for goods like cattle in marriage negotiations. The second project is environmental development. We are not just talking about conservation but adding value to the environment. For instance, we've introduced a coffee shop and leisure areas like pools for fishing. We also have a rich natural habitat with monkeys, birds, and other wildlife that we're working to protect. This creates a harmonious connection between humans and nature, which has often been disrupted by historical misconceptions. We want to promote eco-tourism, where visitors can learn about agriculture, wildlife, and the environment in ways they may not have experienced before.

Finally, we want to highlight the importance of maintaining ecosystems. If forests lose their natural inhabitants like monkeys, birds, and chimpanzees, they can no longer thrive. These animals play a crucial role in forest regeneration, and without them, the ecosystem suffers. This project goes beyond financial gain; it's about sustaining the environment and our natural heritage. In summary, our focus is on bringing innovative solutions to communities in a sustainable, inclusive way, from technology and agriculture to tourism and environmental conservation.







## From the Classroom to Transforming Communities A Testimony from an African Rural University Former Student

Nampeo Josephine

“ARU’s mission is to create effective change agents who work within rural communities to foster self-sustaining transformation. Our graduates are not just trained for the job market but are empowered to become rural transformation specialists who drive positive change in their communities. This unique focus on producing change agents is something that ARU is deeply committed to.”

I am an alumna of African Rural University (ARU), where I currently serve as the Executive Assistant to the Vice Chancellor. I joined ARU in 2014 and graduated in 2018. What sets ARU apart is the visionary approach to rural transformation deeply embedded in the university’s transformative education model.

ARU implements a transformative education model that is divided into 60% theory and 40% practical, allowing students to grasp theoretical knowledge and apply it in real-life scenarios. This balance is essential for helping students analyse and fully understand what they are learning. Our students engage in practical work in the villages through a practicum, where the university collaborates with local governments at both the sub-county and district levels via Memorandums of Understanding (MoUs).

We work closely with host families, and the practicum takes place in their homes, enabling students to immerse themselves in rural life. Internships are also conducted in the villages, where students apply classroom knowledge in real-world settings. One of the unique aspects of our model is the use of campus land. Students are assigned plots of land within the university where they practice what they’ve learned, gaining hands-on experience. This not only equips them with practical skills but also helps them earn income, which they can use to purchase learning materials and further support their education.

ARU’s mission is to create effective change agents who work within rural communities to foster self-sustaining transformation. Our graduates are not just trained for the job market but are empowered to become rural transformation specialists who drive positive

change in their communities. This unique focus on producing change agents is something that ARU is deeply committed to.

“URDT and ARU are committed to promoting better health practices within rural communities. Through our cervical cancer screening project, we have screened 122,448 women, treated 1,922 cases, and referred 112 women to the Mulago Cancer Institute for further care. This initiative aligns with Sustainable Development Goal 3, which focuses on ensuring good health and well-being.”

Upon graduation, I had the opportunity to join the Uganda Rural Development and Training Program (URDT), the organisation that founded ARU in 2006. I was employed as an Epicenter Manager in Ndiaga Sub-County in 2019, where I facilitated community action planning and participatory action research. This involved helping community members envision their

desired futures, assess their current realities, and develop actionable plans to achieve their goals.

Later, I was transferred to Kiboga District, where I worked as a District Epicenter Manager under the Young Africa Works Uganda Project. This project aims to skill 70,000 young people over five years in agriculture, tourism, and construction. So far, we have successfully trained 57,000 youths, equipping them with the vocational and entrepreneurial skills needed to thrive in these sectors. This initiative is a game-changer, as it empowers young people to become self-reliant instead of seeking jobs elsewhere. In addition to this, I had the opportunity to work on a project focused on reducing human-wildlife conflict near Kibaale National Park. This initiative aimed at improving the participatory governance of riparian communities and enhancing the sustainability of their agricultural practices. We encouraged communities to adopt organic farming, particularly given the alarming rise in the use of chemical pesticides, which not only harm crops but also have detrimental effects on wildlife, such as chimpanzees, and pose significant health risks to humans, including cancer.

Speaking of health, URDT and ARU are committed to promoting better health practices within rural communities. Through our cervical cancer screening project, we have screened 122,448 women, treated 1,922 cases, and referred 112 women to the Mulago Cancer Institute for further care. This initiative aligns with Sustainable Development Goal 3, which focuses on ensuring good health and well-being.

Lastly, I would like to extend my gratitude to RENU (Research and Education Network for Uganda) for their partnership and the opportunity to showcase the transformative work being done at African Rural University. I encourage everyone to visit ARU and witness firsthand how we are shaping the future of rural communities through education and empowerment.

Thank you.







## Virtual Campus, Real Learning! Ndejje University's Virtual Campus Vision

By Walusimbi Allan, Ag. Team Leader Academic Information Systems, Ndejje University, DICTS

In the rapidly changing world of education, the emergence of virtual campuses is redefining how students connect with their academic environment. Ndejje University is at the forefront of this transformation, launching a virtual campus that promises to make students active participants in their learning journey. This groundbreaking initiative aims to immerse learners in a vibrant, interactive virtual landscape, offering an experience far beyond traditional online methods.

Imagine a world where students don't just watch a lecture—they are within it, surrounded by a dynamic environ-

ment that makes learning engaging and interactive. Ndejje University's virtual campus is set to make this a reality. With the use of flat screens and increasingly affordable Virtual Reality (VR) headsets, students will step into immersive virtual worlds that go beyond simple digital classroom replicas. These spaces will be rich with interaction, allowing students to engage deeply with content, instructors, and peers.

In this innovative virtual setting, attending lectures, participating in seminars, and collaborating with classmates will feel as natural as if students were physically present on campus.

This approach turns learning from a solitary activity into a communal experience, fostering a sense of presence and engagement often missing in traditional online courses.

**“ This approach turns learning from a solitary activity into a communal experience, fostering a sense of presence and engagement often missing in traditional online courses. ”**

But the virtual campus isn't just about creating immersive environments; it's about seamlessly integrating a wealth of online resources. From learning materials and schedules to student tracking and assessments, these tools will be woven into the fabric of the virtual experience. Students will have everything they need to succeed right at their fingertips. Whether it's accessing course catalogues, enrolling in classes, or purchasing textbooks online, the virtual campus will centralize these activities, making the entire educational process more efficient and accessible.

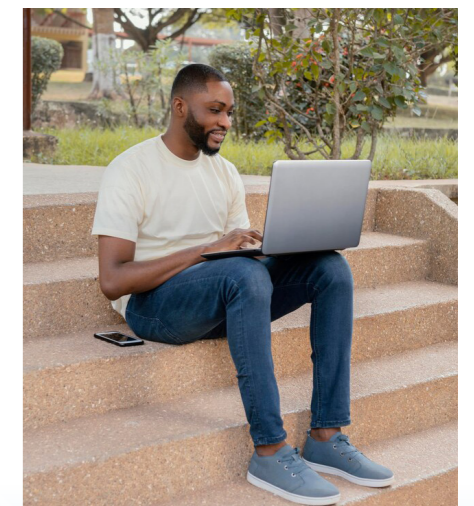
Moreover, the virtual campus is designed with comprehensive student support in mind. Academic advice, mental health resources, and other support services will be available virtually, ensuring that students receive the help they need without ever having to set foot on a physical campus. This level of support will be especially valuable for postgraduate students in the Faculty of Education, many of whom juggle their studies with professional responsibilities.

**“ By leveraging RENU's technological infrastructure and expertise, Ndejje University is building a virtual environment capable of supporting a wide array of academic activities—from conducting research to teaching complex subjects in a captivating and interactive manner. ”**

A key driver of this innovation is Ndejje University's strategic partnership with the Research and Education Network for Uganda (RENU). This collaboration focuses on developing a centralized virtual campus that caters to the diverse needs of researchers, instructors, and students. By leveraging RENU's technological infrastructure and expertise, Ndejje University is building a virtual environment capable of supporting a wide array of academic activities—from conducting research to teaching complex subjects in a captivating and interactive manner.

The vision for the virtual campus goes beyond mere convenience. It represents a significant shift in how education is delivered and experienced. As virtual campuses evolve and expand, they will offer students a full spectrum of services, potentially eliminating the need for physical attendance at the university. This shift will not only save time but will also make education more accessible to students who might face geographical, financial, or personal barriers to attending a traditional campus.

Ndejje University's virtual campus is poised to enhance the learning experience and set a new standard for educational institutions worldwide. By embracing this cutting-edge approach, the university is not just keeping pace with the future of education—it's leading the way.







## Universities Launch Global Coalition to Support Refugee Education at Scale

By Marianne Knarud, Global University Academy

16 universities from across the globe have come together to improve and increase access to higher education for refugees and their communities, where they reside. In response to the urgent need for improved higher education programs and support services for refugees and their communities, several leading universities from three continents recently launched the Global University Academy to develop a universal higher education model. Universities based in Africa, Europe, and North America formed the Global University Academy following a workshop hosted by the University of Oslo in June 2024.

**“With just over 7% of the world’s fast-growing refugee population having some access to higher education resources, the Global University Academy was created to help support the UNHCR’s (UN Refugee Agency) goal of increasing refugee access to higher education to 15% by 2030.”**

With just over 7% of the world’s fast-growing refugee population having some access to higher education resources, the Global University Academy was created to help support the UNHCR’s (UN Refugee Agency) goal of increasing refugee access to higher education to 15% by 2030. The Global University Academy will act as a network of mutual support in response to refugee crises while developing long-term resources for refugees and individuals affected by displacement in multiple contexts to support their right to self-fulfillment.

Over the next 18 months, partners will develop a robust framework for foundation and Bachelor’s degree-level programs that are co-developed and locally embedded. The work will focus on mutual recognition of courses, assuring courses are relevant and of high standards, establishing collaborations with a variety of partners, securing long-term financial support, and evaluating the impact of the initiative.

To develop its long-term response, the Global University Academy will work with university partners whose local communities have been impacted by large numbers of refugees to ensure a truly robust model can be co-created from the start. The Global University Academy will also build on the input and participation of potential learners in refugee communities, refugee-led organizations, and other global voices. Local and global support is also pledged through the Norwegian Refugee Council (NRC), which already supports over 1 million refugee learners in primary and secondary education in over 40 countries, and UNHCR, which is the global leader in refugee higher education response and coordination. It is important to note that the Grieg

Foundation has provided initial support for the development of the GUA.

Svein Stølen, Rector of the University of Oslo, took the initiative to establish the GUA earlier this year (2024), saying: “Education is a human right, and we all need to do more to respond to the education needs of 120 million refugees and displaced individuals globally. With the Global University Academy, we are joining forces to give more people the opportunity to study and fulfil their ambitions.”

### A Uganda Pilot Project

The GUA is currently looking into the possibility to pilot the initiative in Uganda. Key partners in this work are Makerere University and Gulu University, who are already actively engaged in providing access to higher education for refugees, and NRC Uganda. Actors such as the Research and Education Network for Uganda (RENU), have been generous in providing input and advice to this process. The GUA hopes to bring more news about this work early this year.

### GUA Partners

- Arizona State University
- Humboldt University of Berlin
- KU Leuven
- Makerere University
- Norwegian University of Life Sciences
- Paris Sciences & Lettres (PSL) University
- SOAS, University of London
- Southern New Hampshire University
- Stellenbosch University
- University of Bergen
- University of Cape Town
- UCLouvain
- University of Geneva
- University of Hamburg
- University of Oslo
- University of Oxford
- Norwegian Refugee Council
- UNHCR (United Nations High Commissioner for Refugees)
- SAIH (The Students’ and Academics’ International Assistance Fund)







# Advancing Child Welfare The AfriChild Centre's Inter-University Programme

By Clinton Twena Tumanye, Communications Officer, Africhild Centre

## Introduction

In a groundbreaking effort to enhance child-focused research in Uganda, the AfriChild Centre has introduced the Inter-University Programme. This innovative initiative is designed to strengthen university collaboration and provide comprehensive training in child-focused research skills. The programme aims to prepare mid-level researchers to make substantial contributions in this critical field, ultimately improving the lives of children across Uganda.

## Overview of the Programme

The Inter-University Programme, spearheaded by AfriChild Centre, is a landmark initiative focused on equipping researchers with the essential skills needed to conduct high-quality child-focused research. This programme brings together researchers from seven prominent universities across Uganda, fostering collaboration and enhancing the quality and impact of research in the country. The programme seeks to create a robust research community dedicated to advancing child welfare and development by pooling resources and expertise.

## Participating Universities

The success of the Inter-University Programme is built on the strong partnerships the AfriChild Centre has established with the following universities:

- Makerere University
- Kyambogo University
- Nsamizi Training Institute
- Uganda Martyrs University
- Uganda Christian University
- Gulu University
- Muni University
- Islamic University In Uganda
- Addis Ababa University

These institutions, each with its unique strengths, work together to deliver a comprehensive training programme that benefits researchers and the broader community alike.

## Skills and Training

At the heart of the Inter-University Programme is a commitment to providing researchers with the skills they need to excel in child-focused research. The training covers a wide range of critical areas, including:

- **Advanced research methodologies:** Participants receive in-depth training in methodologies specific to child welfare and development, ensuring their research is both rigorous and relevant.
- **Grant acquisition techniques:** The programme equips researchers with the skills needed to successfully secure funding for their projects, enabling them to pursue impactful research that can drive meaningful change.
- **Publication strategies:** Researchers learn effective strategies for publishing their findings in reputable journals and platforms, ensuring their work reaches a wide audience, and influences policy and practice.

“The Inter-University Programme is more than just a training initiative; it is a catalyst for change in the field of child-focused research in Uganda.”

## Programme Benefits

Researchers who participate in the Inter-University Programme gain a wealth of skills that empower them to:

- **Conduct high-quality research:** Equipped with advanced methodologies, researchers can conduct studies that address the pressing needs of children in Uganda, contributing to the body of knowledge in this field.
- **Secure funding:** With enhanced grant acquisition skills, participants are better positioned to obtain the funding needed to support their research, ensuring their projects have the resources required for success.
- **Disseminate findings effectively:** The programme's emphasis on publication strategies ensures that researchers can share their findings widely, influencing policy and practice in the field of child welfare.

## Impact on Child-focused Research

The Inter-University Programme is more than just a training initiative; it is a catalyst for change in the field of child-focused research in Uganda. By fostering a network of skilled researchers and promoting inter-university collaboration, the programme contributes to the overall improvement of child welfare research in the country. This, in turn, has a direct impact on the lives of children and communities, as high-quality research informs better policies, practices, and interventions.

## Conclusion

The AfriChild Centre's Inter-University Programme represents a significant advancement in the field of child-focused research in Uganda. By equipping researchers with essential skills and fostering collaboration between universities, the programme ensures that high-quality, impactful research continues to drive improvements in child welfare and development. As this programme continues to grow and evolve, it will undoubtedly play a crucial role in shaping a brighter future for Uganda's children.







# Technology





One of the major challenges in Uganda's education system is the large student-to-teacher ratio, which exceeds 50:1 in most areas of the country, particularly in government-funded schools.

## The Potential of AI in the Research and Education Sector of Uganda

By Arthur Tumwesigye, Senior Networks Engineer, RENU

Artificial Intelligence (AI) has emerged as a transformative technology with the potential to revolutionise many sectors globally, including research and education, in pursuit of fulfilling the United Nations Sustainable Development Goals (SDGs). In Uganda, where the education system and research infrastructure face significant challenges such as infrastructural deficiencies, data quality issues, and a lack of skilled personnel, AI presents a unique opportunity to overcome some of these barriers and accelerate progress in both fields. By leveraging AI's capabilities, Uganda can enhance educational access, improve teaching and learning processes, and foster more effective and innovative research. This article explores the potential applications of AI in research and education within the Ugandan context.



### Personalized Learning in Uganda's Education System

One of the major challenges in Uganda's education system is the large student-to-teacher ratio, which exceeds 50:1 in most areas of the country, particularly in government-funded schools. Overcrowded classrooms make it difficult for teachers to provide individual attention to students, resulting in varied levels of learning.

AI-powered adaptive learning systems can address this challenge by delivering personalised learning experiences tailored to each student's needs. These systems can analyze a student's performance in real time, identifying areas of strength and weakness, and offering customised content that caters to their learning pace. For instance, if a student in rural Uganda struggles with Mathematics, an AI-driven platform can provide additional exercises, video tutorials, and instant feedback to help the student improve. Such systems can significantly reduce the learning gap, enabling students in under-resourced schools to access high-quality educational support.

### Enhancing Teacher Effectiveness and Training

In Uganda, many rural schools lack trained teachers, and professional development opportunities for educators are often limited. AI will help bridge this gap by offering remote training and development tools. AI-driven platforms can provide online training modules, simulations, and lesson planning resources tailored to the Ugandan curriculum. Teachers can use these tools to improve their skills and stay updated on new teaching methods, leading to better classroom management and improved student outcomes. Additionally, AI can automate administrative tasks like grading and tracking student progress, allowing teachers to focus more on teaching and mentoring students. This will enable educators to deliver higher-quality instruction and foster a more engaging learning environment.



In many parts of rural Uganda, access to quality education remains a significant challenge due to a lack of resources, infrastructure, and trained teachers. AI-driven educational platforms, accessible via mobile devices, can help deliver quality learning materials to remote areas.

### AI-powered Language Translation for Inclusive Education

Uganda is a multilingual country with over 40 local languages, and this linguistic diversity often poses challenges in education. While English is the official language of instruction, students from rural areas may struggle to understand content delivered in English. AI-powered language translation tools can help overcome this barrier by translating educational materials into local languages. This would enable students to grasp concepts in their native languages, making learning more accessible and inclusive. Additionally, AI can support students with special needs, such as those who have visual or audio impairment. AI-driven

technologies like speech-to-text systems, screen readers, and sign language translators can help create a more inclusive educational environment, ensuring that all students receive the support they need to succeed.

### Accelerating Scientific Discovery in Uganda

Research in Uganda faces several challenges, including limited funding, access to advanced research tools, and inadequate infrastructure. AI can help address these issues by enabling researchers to analyse large datasets more efficiently and discover insights that may be difficult or impossible to detect manually. For example, in health research, AI-powered tools can assist Ugandan researchers in analyzing medical data to identify patterns in disease outbreaks, improve diagnostic accuracy, and develop more effective treatments. In Agriculture, AI can analyse data on soil quality, weather patterns, and crop yields to provide insights for improving food production and tackling food insecurity. This is particularly beneficial in a country where Agriculture is the backbone of the economy and ensuring food security is a priority. Furthermore, AI can support research in environmental science, where analysing complex ecosystems and biodiversity is critical to addressing challenges such as deforestation, wildlife conservation, and climate change. AI models can predict environmental changes, helping researchers and policymakers make informed decisions to safeguard Uganda's natural resources.

### AI for Educational Access in Rural Uganda

In many parts of rural Uganda, access to quality education remains a significant challenge due to a lack of resources, infrastructure, and trained teachers. AI-driven educational platforms, accessible via mobile devices, can help deliver quality learning materials to remote areas. Mobile phone penetration in Uganda is relatively high compared to other forms of infrastructure, making mobile-based AI educational platforms a feasible solution for providing access to education in underserved regions. These platforms can offer interactive learning experiences, video tutorials, and quizzes, enabling students to learn independently. Additionally, AI-powered chatbots can provide real-time assistance to students, answering questions and guiding them through learning modules. Additionally, it is possible to create learning applications that can function without an Internet connection. This could significantly improve the educational outcomes for students in rural Uganda who may not have access to traditional learning resources.







**For AI to be successfully integrated into education and research, students, teachers, and researchers must be equipped with the skills to use these technologies effectively.**

### Challenges and Considerations

While AI holds great potential for improving research and education in Uganda, several challenges need to be addressed. Firstly, the issue of digital infrastructure must be tackled. For AI technologies to be effective, reliable Internet access and digital devices are necessary; however, many areas in Uganda still lack this infrastructure. Investment in digital Internet connectivity, particularly in rural areas, is essential to ensure that AI-driven solutions can reach all corners of the country. Concerned stakeholders like RENU, Uganda Communications Commission (UCC), and others are effectively bridging this digital divide through partnership. Another solution could be offering subsidized Internet

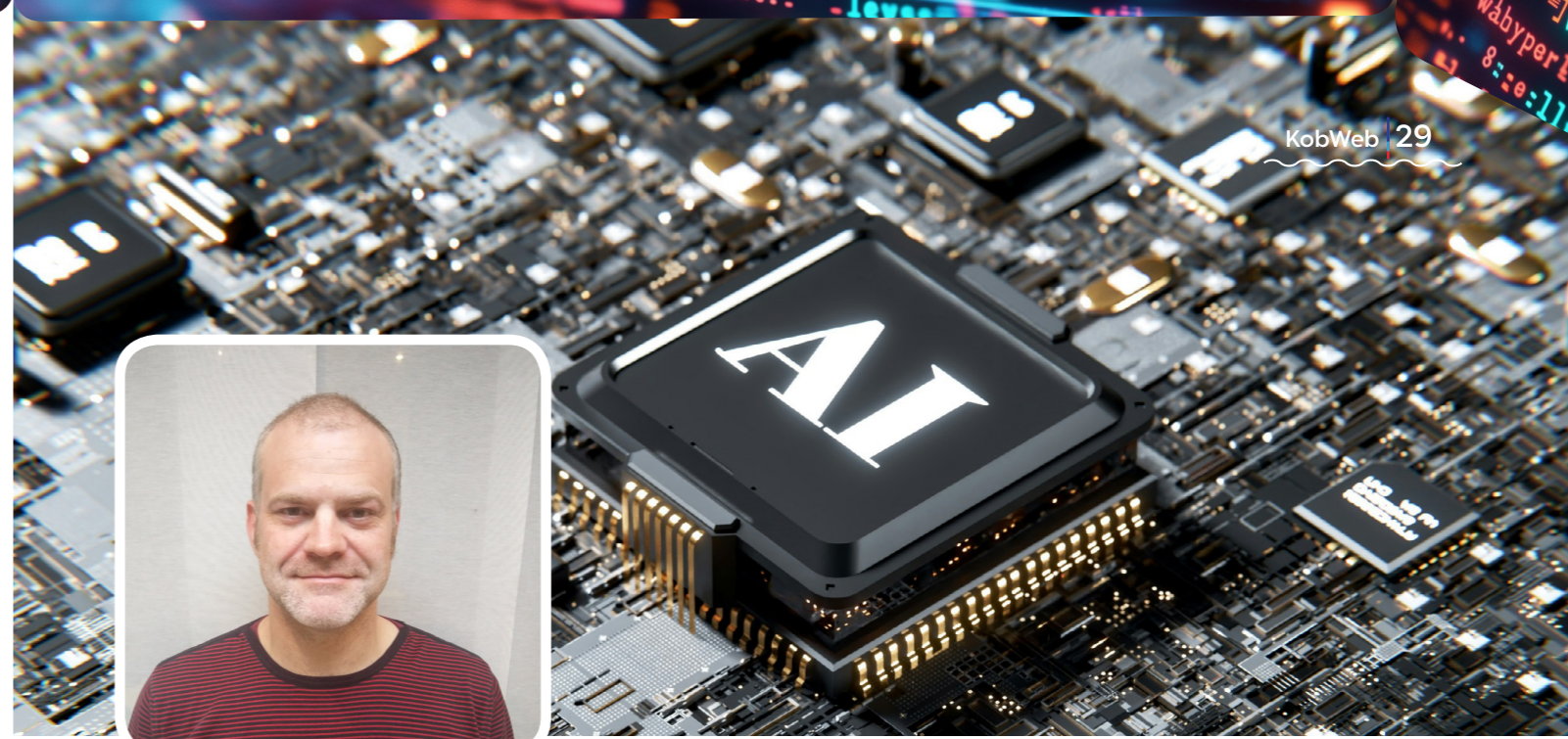
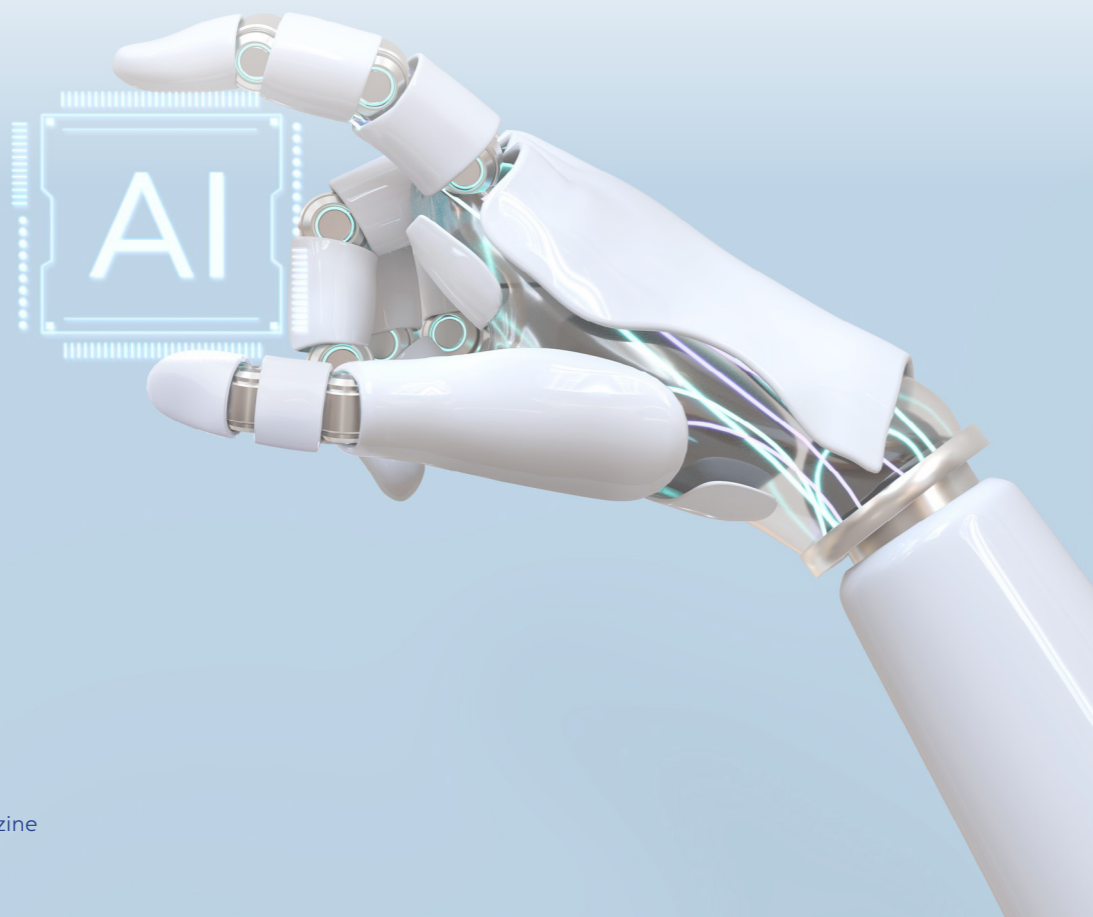
bundles to students for study purposes. The government of the Republic of Uganda could partner with Internet Service Providers, such as RENU and others, to provide students with affordable Internet access. This is vital not only for using AI in education but also for accessing other learning aids like videos.

Secondly, there is a need for digital literacy and AI education. For AI to be successfully integrated into education and research, students, teachers, and researchers must be equipped with the skills to use these technologies effectively. Uganda, through the Ministry of Education and Sports (MoES) and National Curriculum Development Centre (NCDC), will need to invest in digital literacy programs and AI-related training to build the necessary capacity for utilising AI across different sectors.

Finally, ethical considerations surrounding the use of AI—such as data privacy, bias in AI algorithms, and the potential loss of jobs due to automation—must be carefully managed. Uganda will need to develop policies and regulations that ensure the ethical use of AI while maximising its benefits for society.

### Conclusion

AI presents a tremendous opportunity for Uganda to address the long-standing challenges in its education and research sectors. From personalised learning and teacher training to accelerating scientific discoveries and promoting inclusive education, AI can drive significant improvements in both fields. However, for these benefits to be fully realised, Uganda must invest in digital infrastructure and penetration, promote AI education, and develop policies that ensure the ethical use of AI technologies. With the right strategies in place, AI could play a crucial role in shaping Uganda's future as a hub of innovation and educational excellence.



## Harnessing AI to Solve Local Challenges The AHUMAIN Project

By Dirk Van Merode, MSc, AHUMAIN Project Coordinator



**The AHUMAIN Project applies cutting-edge technology to tackle critical challenges in East Africa, including air pollution, water management, agriculture, and healthcare.**

Artificial intelligence (AI) is at the forefront of global discussions, often highlighting both the risks and opportunities associated with its rapid development. Beyond the media buzz, AI is increasingly being deployed to address pressing social challenges. A key example of this is the AHUMAIN Project, an Erasmus+ initiative to apply AI to solve real-world problems in East Africa. RENU, alongside AP University of Applied Sciences and universities from Uganda, Tanzania, Cyprus, and Spain, is a core partner in this European-funded project.

As part of the AHUMAIN Project, RENU plays a crucial role in providing technical support. This includes setting up and managing learning management systems, maintaining the project's website, and overseeing the AI lab platform. These digital infrastructures are essential for the smooth functioning of the project, enabling East African institutions to integrate AI solutions effectively.

### Addressing East Africa's Challenges with AI

The AHUMAIN Project applies cutting-edge technology to tackle critical challenges in East Africa, including air pollution, water management, agriculture, and healthcare. Dirk Van Merode, the Project Coordinator from AP University of Applied Sciences, shared, "We've already developed solutions to monitor water quality and levels, and we can automatically alert local communities when problems arise. Right now, we're working on similar solutions for air pollution, agriculture, and healthcare. What's crucial is that we involve local teachers and students to ensure these innovations directly address the needs of their communities."

### A Platform for European-African Collaboration

Funded by the European Union through Erasmus+, the AHUMAIN Project fosters international cooperation in AI and Data Science. Courses are offered in collaboration with local universities, governments, and businesses, while the project also facilitates international exchanges. African students collaborate with European counterparts in countries like Belgium, Germany, and Greece on AI-driven projects. Meanwhile, European students are in East Africa, where they are developing Internet of Things (IoT) applications focused on air pollution and soil salinity.

For many students, it is not just an academic journey but an opportunity to make a real impact. "Our students in Zanzibar are working on the region's first 'Internet of Things' applications," Van Merode explained. "For them, this experience is much more than classroom theory. They're applying what they've learned to create tangible solutions that help communities."

### Creating Technological and Social Impact

Van Merode emphasized the broader significance of the project: "We're living in a time of rapid AI advancement, with countries and companies around the world investing heavily in this technology. We want to ensure that Africa doesn't fall behind and that a new digital divide isn't created. AHUMAIN is our way of closing the AI gap in Africa." The AHUMAIN project is a platform for innovation and development, addressing local challenges while fostering international collaboration. Regular updates on the project's progress and new initiatives can be found on the AHUMAIN website and the Karume Innovation Hub site.

For more information, visit:

[AHUMAIN Official Site] (<https://ahumain.africa>)  
[Karume Innovation Hub] (<https://kih.kist.ac.tz/>)





# Navigating the Cybersecurity Landscape A Call to Action

By William Kibirango, Cybersecurity Engineer, RENU

## Global context

As the digital ecosystem continues to grow in complexity, so does the cyber threat landscape. Organisations worldwide are dealing with increasingly sophisticated attacks that target their infrastructure, personnel, and supply chains. Six prominent areas have emerged as critical points of focus: ransomware, supply chain attacks, Internet of Things (IoT) vulnerabilities, cloud security, Artificial Intelligence (AI) and Machine Learning (ML) attacks and defences, and social engineering. Below is a detailed examination of each of these areas.

“Ransomware remains one of the most prevalent and damaging cyber threats. These attacks involve encrypting an organisation’s data and demanding payment (usually in cryptocurrency) for the decryption key.”

## Ransomware

Ransomware remains one of the most prevalent and damaging cyber threats. These attacks involve encrypting an organisation’s data and demanding payment (usually in cryptocurrency) for the decryption key. Ransomware attacks have grown in scale, targeting critical infrastructure, healthcare systems, and even entire cities. One no-

table example is the Colonial Pipeline attack in 2021, where a ransomware attack led to the shutdown of a major U.S. fuel pipeline, causing widespread disruption and fuel shortages. The attackers exploited vulnerabilities in Colonial’s network, likely through phishing emails or compromised credentials. Additionally, ransomware-as-a-service (RaaS) has emerged, allowing attackers with limited technical skills to launch sophisticated attacks using pre-packaged tools available on the dark web.

## Supply Chain Attacks

Supply chain attacks represent a growing threat, targeting vulnerabilities in third-party vendors or service providers to gain access to larger, more secure organisations. One of the most infamous supply chain attacks occurred in 2020 with the SolarWinds breach. Attackers inserted malicious codes into SolarWinds’ Orion software updates, which were then distributed to thousands of organisations, including U.S. government agencies and Fortune 500 companies.

## IoT Vulnerabilities

The rise of Internet of Things (IoT) devices has introduced a new frontier of security vulnerabilities. IoT devices, which range from smart thermostats to industrial control systems, are often deployed with weak default passwords, unpatched firmware, and limited security oversight, making them prime targets for cyber-criminals. The Mirai botnet, which first emerged in 2016 and saw a resurgence in 2022, leveraged IoT vulnerabilities to launch distributed denial-of-service (DDoS) attacks by hijacking millions of devices. These devices, often called “bots,” can be controlled remotely to do harmful things like sending out spam emails, stealing personal information, or even making websites crash by overloading them with too much traffic. The Mirai botnet targeted everyday Internet-connected devices like cameras and digital recorders that were not properly secured. Mirai used these devices to launch a huge attack that temporarily broke parts of the Internet, affecting many popular websites.

## Cloud Security

As more organisations migrate data and applications to the cloud, securing these environments has become a pressing concern. Misconfigured cloud storage systems have led to numerous breaches, with attackers gaining unauthorised access to sensitive data. In 2023, several high-profile cloud storage breaches occurred due to simple misconfigurations, such as leaving Amazon S3 buckets open to the public.

## AI and Machine Learning Attacks

Artificial Intelligence (AI) and machine learning (ML) are increasingly used to enhance cybersecurity efforts. However, attackers are also leveraging AI to develop more advanced cyberattacks. One major concern is the use of AI for deepfake attacks, where attackers create convincing synthetic media to impersonate individuals and manipulate sensitive situations. In 2022, a notable deepfake attack targeted a financial services firm, where attackers used AI-generated voice impersonation to request a fraudulent transfer of USD 35 million.

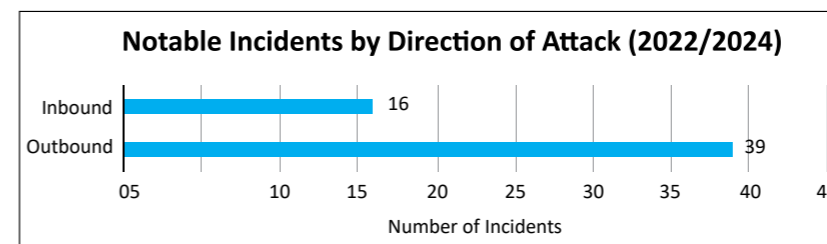
## Social Engineering

Social engineering attacks, particularly phishing, remain one of the easiest ways for attackers to gain access to an organisation’s systems. These attacks manipulate human psychology, tricking individuals into revealing sensitive information or performing unauthorised actions. In 2020, a high-profile social engineering attack targeted Twitter (X) where attackers used spear-phishing techniques to gain access to internal systems and compromise several high-profile accounts, including those of prominent political figures and celebrities.

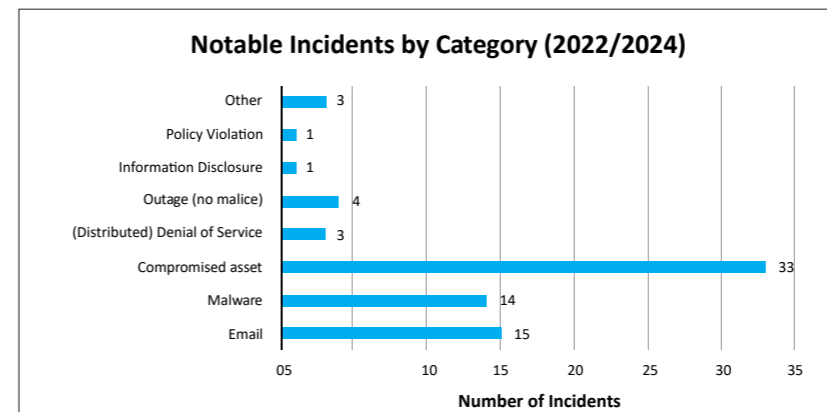
The cyber threat landscape is clearly more complex than ever, with attackers employing a range of tactics from ransomware to AI-driven deepfakes. Indeed, all IT practitioners are facing almost insurmountable odds against the “bad-guys” of the Internet. The more worrying thing is; it doesn’t end there. Apparently, danger looms in our own backyard as well.

## RENU’s Context

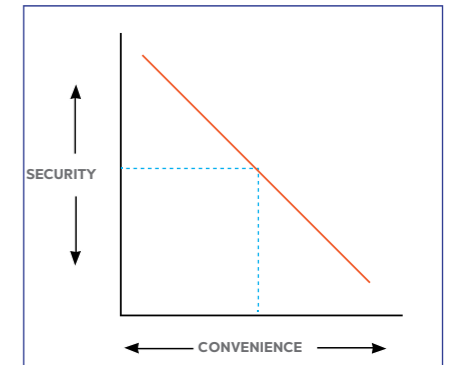
Bringing it a little closer to home, in the period of September 2022 to July 2024, RENU faced up to 55 notable cybersecurity incidents, 39 of which originate from the National Research and Education Network (NREN) and are targeting systems on the general Internet.



During the investigation of these incidents, the majority were caused by compromised assets such as network devices and servers, compromised email accounts, and infected computers. In total, of the 55 incidents recorded, 33 were attributed to compromised assets/accounts, 15 to email issues, and 14 to malware infections.



The investigations also revealed that the root causes of these incidents were users clicking on email phishing links, email servers misconfigured to run as open relays, user computers downloading and installing software from untrusted sources, network services running exposed vulnerable software, and user accounts set up with weak authentication mechanisms or credentials, among other things.



These issues are relatively easy to prevent, but the real question is: why are they not being paid attention to? The answer to this question is simple: Security vs Convenience. Issues often arise when one of these is prioritised over the other. If one understands how these aspects are related, the problems become clear. If one understands how these aspects can be balanced, the solutions become clear as well.

## What Can we Do?

In an age where cyber threats are evolving at an unprecedented rate, the RENU community must adopt a proactive approach to secure their systems and data. Cybersecurity is no longer just a concern for IT teams; it’s a critical part of overall organisational resilience. Below, we explore essential strategies to prevent cyberattacks and minimise the damage when they occur.

## Security Awareness Training

The first line of defence against cyberattacks is your workforce. Regularly educating staff on how to recognise phishing emails, suspicious links, and other common attack vectors reduces the likelihood of human error. Simulated phishing campaigns can help identify gaps in awareness and build a more vigilant team. In the case of the



Twitter (X) incident in 2020, having a more robust awareness program could have literally saved them millions.

“By investing in employee training, maintaining strong technical defences, and preparing for potential incidents with a solid response plan, your institution can greatly reduce its vulnerability to cyberattacks.”

**Multi-Factor Authentication (MFA)**

Relying solely on passwords is risky. Multi-factor authentication (MFA) requires users to verify their identity through multiple methods (e.g., a password and a fingerprint), making it much harder (though not impossible) for cybercriminals to access accounts, even if passwords are compromised. In the case of the Colonial Pipeline attack in 2021, the issue could have been prevented by stronger (MFA) practices. In addition, the segmentation of critical systems from external-facing networks, combined with regular vulnerability assessments, would have limited the lateral movement of the attackers within the network.

**Regular Patching and System Updates**

Keeping software, hardware, and systems up to date with the latest security patches is critical. Cybercriminals often exploit known vulnerabilities in outdated systems. By regularly testing and applying security patches, you close the door to many potential attacks.

**Data Backups**

Regularly backing up data is essential for ensuring that critical information can be restored in the event of an attack, especially ransomware attacks. These backups should be encrypted and stored securely to prevent data loss and minimise downtime. Follow the 3-2-1 rule: 3 data backup copies, on 2 separate media, 1 of which is remote!

**Email Protection and Filters**

Email is a primary vector for attacks like phishing and malware. Implementing robust email filtering solutions that block suspicious attachments and links can prevent harmful emails from reaching employees' inboxes.

**Access Control and Least Privilege**

Grant users only the access they need to perform their jobs. This limits the damage that can be done if an account is compromised. Implementing strict access control policies is essential for reducing risk. This extends well to the concept of network segmentation; ensuring that only specific networks can communicate with one another as needed, and nothing more.

**Security Audits and Testing**

Conducting regular security audits and penetration tests helps identify vulnerabilities before attackers do. This proactive approach ensures that potential weak spots are addressed in time. A 2022 CoreSecurity Penetration Testing report revealed that 75% of companies perform penetration tests to measure their security posture. Your organisation should adopt this strategy

and increase this statistic. Going back to the case of the Mirai botnet, to prevent incidents like those, organisations deploying IoT devices should maintain robust network segmentation, ensuring that vulnerable IoT systems are isolated from critical infrastructure. Conducting regular security assessments and vulnerability scans on IoT systems can help detect and resolve those kinds of weaknesses before they are exploited.

**Incident Response Plan**

Having a detailed and well-rehearsed Incident Response (IR) plan allows your organisation to act quickly in the event of a cyberattack. The plan should outline steps for containing the threat, communicating with stakeholders, and recovering operations.

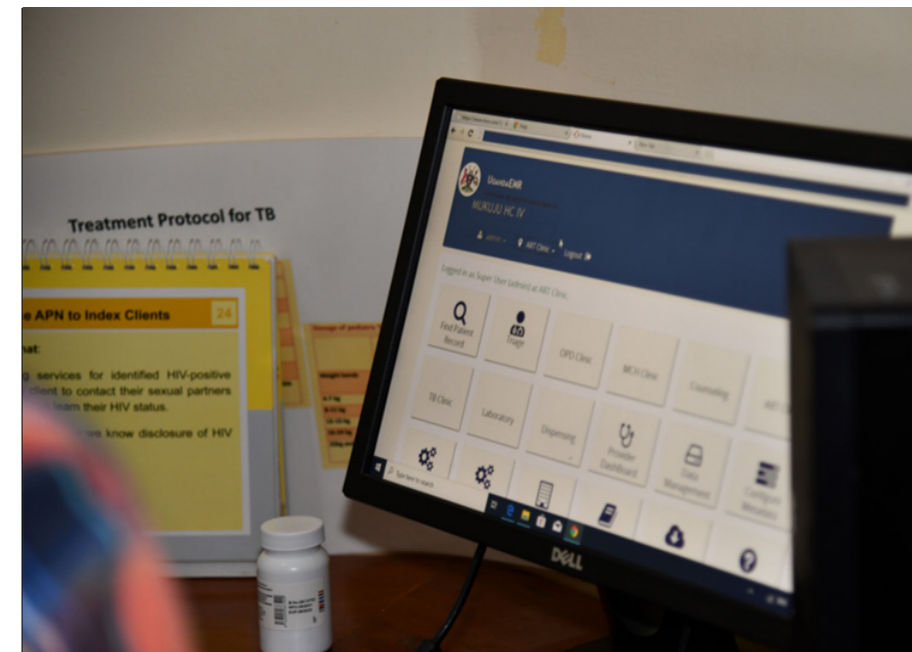
**Conclusion**

Cybersecurity requires a layered approach that includes both proactive measures and a clear plan for responding to incidents. By investing in employee training, maintaining strong technical defences, and preparing for potential incidents with a solid response plan, your institution can greatly reduce its vulnerability to cyberattacks. In a digital world full of emerging threats, being prepared is not just an option—it's a necessity.



# How Internet Connection is Transforming HIV Case Management in Tororo District

By Sidney Emmy Akuma, Baylor Foundation Uganda



The national electronic medical record system in Uganda, which uses a dedicated Internet connection to synchronize patient management and medical care.

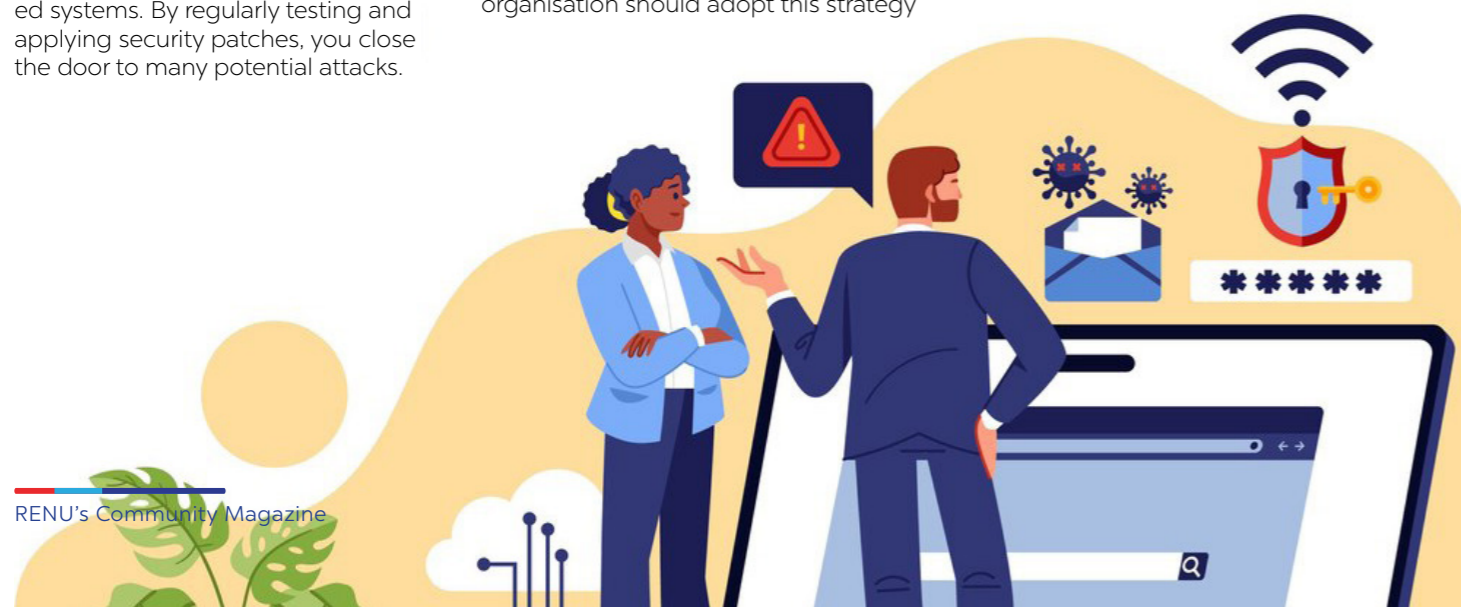
In Tororo District, the introduction of reliable Internet connection is revolutionizing HIV case management, transforming the experience for both patients and healthcare providers.

Soita Williams, a 63-year-old HIV-positive resident of Amoon B village in Tororo District, is one of the many beneficiaries of this change. Williams recalls how clinic visits used to be a source of emotional distress. “The

lengthy clinic process took an entire day as clinicians took 40 minutes to examine each patient,” he says. This inefficient system meant that patients like Williams had to wait for hours.

However, the system has significantly improved thanks to an Internet-driven transformation. Now, the process takes around 10 minutes, and Williams appreciates the speed and efficiency of the computerized system that has replaced the old manual documentation method. “The clinical process is now smooth and quick, making me smile every time I go there,” he adds.

This transformation was made possible by Baylor Foundation Uganda (BFU), supported by the USAID Local Partner Health Services Eastern Activity. In response to recurring network issues and data challenges faced by healthcare facilities, BFU installed dedicated Internet connections. Previously, healthcare staff used personal phones to tether connections to the national health information system, making data management inefficient. BFU partnered with RENU, a leading Internet solutions provider, to implement the Electronic





Medical Records (EMR) system in key healthcare centres.

The upgrade included providing routers, boosters, air cubes, and other equipment to ensure fast and reliable Internet. As a result, the number of care points with Internet access increased. Mukuju Health Centre (HC) IV, for example, extended its Internet services beyond the data room and laboratory, reaching the HIV Clinic and Outpatient Department. This expansion has significantly improved patient monitoring and care.

Kutoi Joseph, a Data Assistant at Mukuju HC IV, highlights the difference the dedicated Internet has made. "Data issues used to affect our work, but now it's easier to send and receive

data," he explains. The EMR system updates patient records in real time, reducing the time needed to handle each case and improving documentation accuracy.

Additionally, healthcare workers now have access to the Central Public Health Laboratories (CPHL) system, which syncs with the EMR system. This integration allows teams to access critical information, such as viral load and test results, enabling timely medical interventions for HIV and care.



## First ROUTERS made in Uganda



## Leveraging Solar-powered Routers to Provide Internet Connectivity in Underserved Communities

Micheal Nasasira, Network and Production Engineer, RENUMESH Technologies and Arthur Tumwesigye, Senior Networks Engineer, RENU ([mnasasira@renumesh.africa](mailto:mnasasira@renumesh.africa), [atumwesigye@renu.ac.ug](mailto:atumwesigye@renu.ac.ug))

### Abstract

In the rapidly evolving digital era, Internet connectivity is crucial for socio-economic development. Yet, many communities in Africa remain disconnected due to unreliable power infrastructure. This paper presents a sustainable solution from RENUMESH Technologies – solar-powered Internet routers designed for off-grid areas. Utilizing abundant solar energy, these routers offer a reliable and eco-friendly method to enhance Internet access, thereby bridging the digital divide. The innovation leverages energy-harvesting power electronics to convert and manage solar energy effectively,

ensuring continuous operation with battery packs that provide power for 5 days in the absence of sunlight. The routers' Power over Ethernet (PoE) functionality extends their utility to additional devices, crucial for IoT applications in different settings. Case studies from different 103 deployments across Uganda show significant gains in Internet accessibility and reliability for educational and research institutions, as well as local communities. This is evident in the increase in the number of unique users, which rose from 24,147 to 30,052 between January and April 2024. Beyond providing seamless connectivity, these implementations also offer valuable insights

into local climate patterns by analyzing data on energy usage and charging cycles stored in a central database, supporting environmental monitoring. Our findings underscore the potential of solar-powered technologies to revolutionize Internet access in energy-constrained regions, contributing to a more connected and sustainable future. This approach aligns with global sustainability goals and showcases the pivotal role of renewable energy systems in overcoming infrastructural challenges.

Index Terms—Solar-powered routers, off-grid areas, solar energy, reliable Internet access.



**I. INTRODUCTION**

Solar-powered routers [1] emerge as a beacon of connectivity in the vast landscape of Africa, where unreliable power supply has long hindered the proliferation of Internet services. As a solution born out of innovative thinking, the routers address the challenge by harnessing solar energy, making them ideal for areas where electricity is a luxury. Unlike the other routers that rely on grid power, the solar-powered routers tap into the most readily available source of energy: the sun [2]. Fig. 3 shows the distribution of solar energy in Uganda, where most areas fall above 3.5 kWh/kWp, specifically: Excellent: Above 4.5 kWh/kWp Favorable: 3.5 - 4.5 kWh/kWp Low End: Below 3.5 kWh/kWp. This ensures uninterrupted service even in the absence of sunlight due to the batteries coupled inside it that can hold a charge for 5 days depending on the usage load. It also champions eco-friendly technology. These routers use mesh technology, where one router with an Internet connection can relay the signal to other routers within 350 meters.

This reduces the need for extensive cable infrastructure. The routers are equipped with a range of features and specifications outlined in Table. I, which together meet the connectivity needs of off-grid regions in Africa and worldwide. Fig. 1 shows the internal components of the solar-powered router, while Fig. 2 shows its external components.

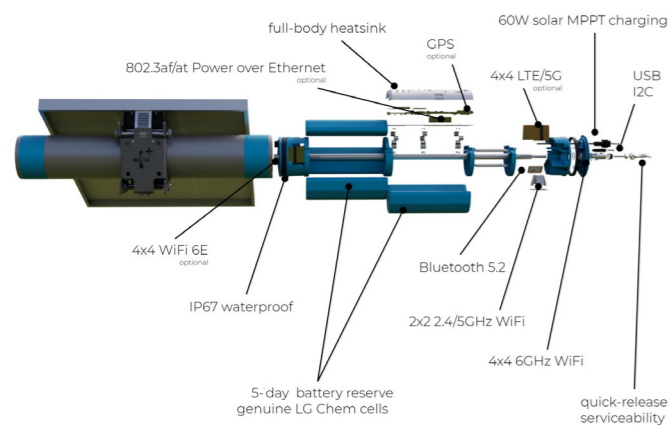


Fig. 1. Inner components of the solar-powered router. [3]

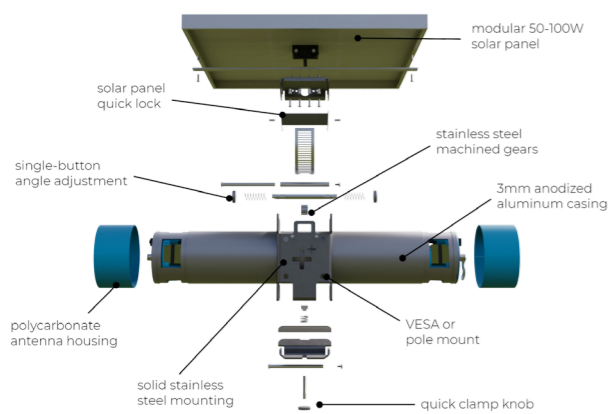


Fig. 2. External components of the solar-powered router. [3]

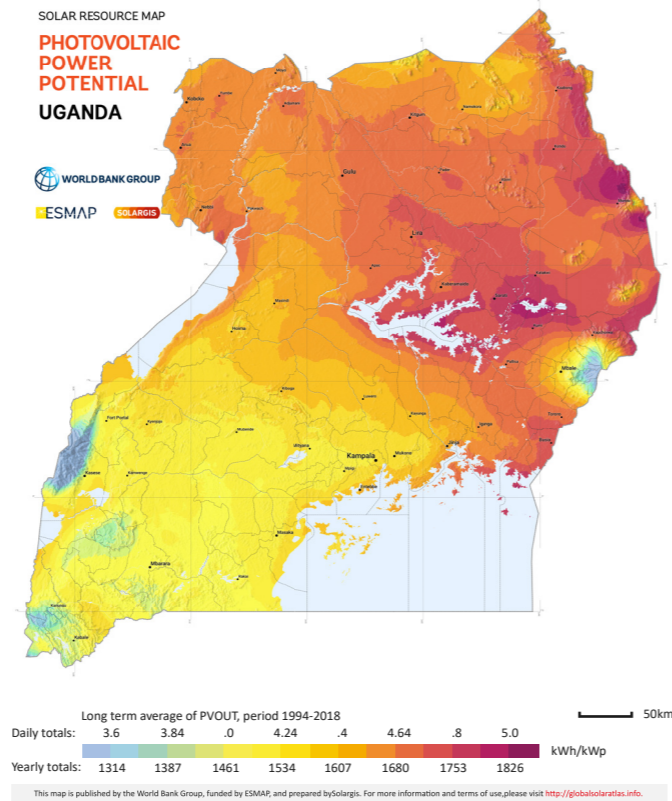


Fig. 3. Solar energy distribution in Uganda. [2]

**II. METHODOLOGY**

Like any other router, the devices require an Internet connection to operate. They offer three different last-mile technologies for achieving this, including the following:

- Ethernet. The router is connected to an existing wired network infrastructure using an Ethernet cable that terminates in a USB hub, providing a stable and high-speed Internet connection while ensuring minimal interference. This provides speeds up to 1000 Gbps.
- SIM card. This is specific to a network operator and enables mobile wireless connectivity over extensive geographic areas. By using a SIM card, the router connects to the Internet, supporting 3G, 4G, and 5G networks. The device features two SIM card slots with 4X4 LTE antennas to enhance availability; one SIM card can serve as the primary connection while the other acts as a backup, or both can be used simultaneously. This configuration allows the router to be deployed in areas with cellular network coverage. However, the speed and coverage are contingent on the network reach of the associated mobile operator. In Uganda, RENU leverages MTN as its mobile network operator with a private APN. This setup enables it to use solar-powered routers with MTN SIM cards to extend connectivity to underserved communities, such as Kalangala Island in the central part of the country.
- Power over Ethernet (PoE). This setup allows both power and data to be transmitted simultaneously, eliminat-

ing the need for separate power cables. It is particularly useful when the router is powering a microwave dish for an Internet connection. This involves incorporating a PoE (power over Ethernet) module with a voltage range of 12-24V into the router. The solution is primarily deployed in areas without power outlets, enabling the microwave dishes to function as the last mile of Internet connectivity. This technology minimizes the need for additional power infrastructure, thereby lowering installation costs. However, the voltage range of 12-24V might not be sufficient for all devices, potentially limiting the types of network devices that can be utilized.

**TABLE I**  
**SPECIFICATIONS OF THE SOLAR-POWERED ROUTER**

Hardware specifications of the router	
CPU	1.8GHz quad-core ARM A53
Memory	1GB (up to 2GB)
Boot Type	32MB NOR flash, 12GB NAND flash
Internal Expansion	MicroSD, dual SIM, 2x M.2
Wired Connectivity	2x USB 2.0, RJ45 GbE LAN/WAN
Wireless specifications of the router	
2.4GHz	2x2 802.11b/g/n/ax 27dBm/chain (574 Mbps)
5.8GHz	2x2 802.11a/n/ac/ax 25 dBm /chain (1201 Mbps)
6GHz	4x4 802.11ax 23 dBm / chain (5000 Mbps)
Cellular	CAT4-CAT20 4G LTE or sub-6GHz 5g Dual-SIM
Antennas	4x6GHz N-type female
Bluetooth	Bluetooth5
Power specifications of the router	
AC charger (power delivery)	60W USB-C PD
Power over Ethernet	13W 802.3af/at
Solar Panel	80W
Solar	18Vmpp 4A
Batteries	18650 lithium-ion, 894Wh (stock) - 1.2kWh

**III. RESULTS**

RENUMESH Technologies, in collaboration with RENU, the Ugandan NREN, has so far deployed 103 solar-powered routers to provide free, secure, and trusted wireless Internet connections to students and researchers outside their institutions within different regions of the country. These deployments have resulted in an increment in the number

of unique users from 24,147 to 30,052 between January and April, with an average of 750 users connected per day.

Additionally, they have been deployed at numerous institutions in remote areas of the country with power challenges, like Lokopio Hills Technical Institute in the West Nile and African Rural University in the western region. Since the time of deployment, they have provided stable and reliable Internet connectivity to users in these areas. Fig. 4 shows the number of routers deployed, while Fig. 5 depicts the number of users connected to a single router at the same time.

Fig. 6 illustrates the charging patterns of three different routers installed at Lokopio Hills Technical Institute. It is evident that the routers charge exclusively during the day when sunlight is available. Fig. 7 illustrates the service up-time of one of the nodes installed at Lokopio Hills Technical Institute.

The router maintains an online status even at night, despite only charging during the day. This continuous, stable connection is made possible by the internal lithium-ion batteries, which store sufficient charge to ensure operation throughout the night. Fig. 8 shows the throughput and capacity utilization of a solar-powered router deployed at the ITU Global Conference, which took place in Uganda at the beginning of July 2024.

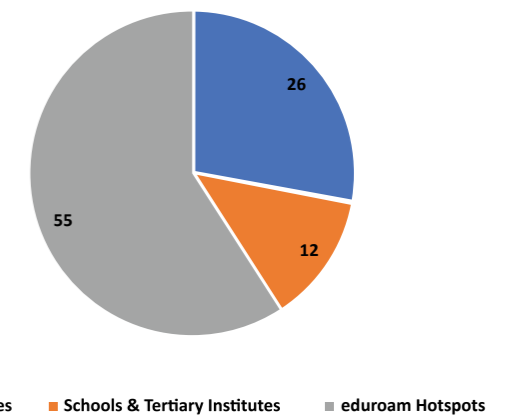


Fig. 4. Number of solar-powered routers deployed.

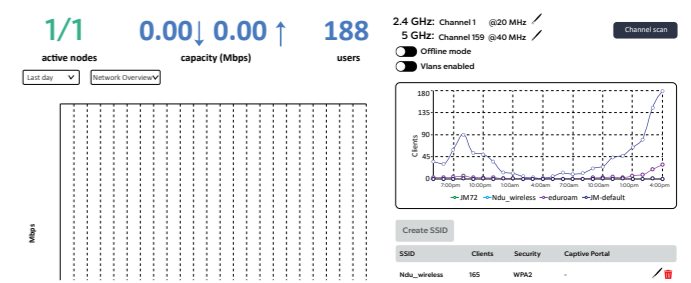


Fig. 5. Users connected on one solar powered router.



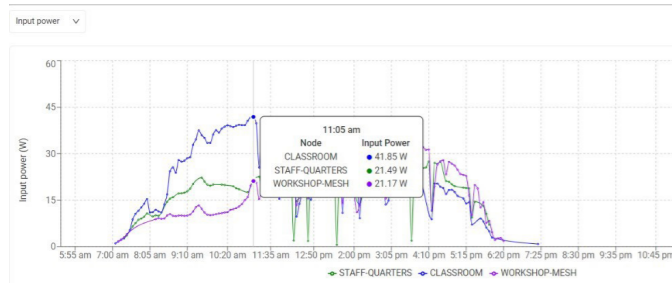


Fig. 6. Charging pattern of three solar-powered routers deployed at Lokopio Hills Technical Institute.

#### IV. THE FUTURE

As solar energy utilization [4] and technology continue to advance, the demand for sustainable and resilient Internet connectivity grows; therefore, the future of these devices is poised for significant growth and innovation. RENUMESH is embarking on improving these devices with new technologies, as discussed below.

- Embedded Subscriber Identity Modules (eSIMs): This technology eradicates the necessity of having a physical SIM card by incorporating a programmable SIM chip directly into these devices.

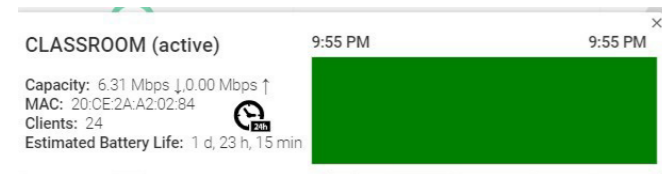


Fig. 7. Service uptime of a solar-powered router installed at Lokopio Hills Institute.

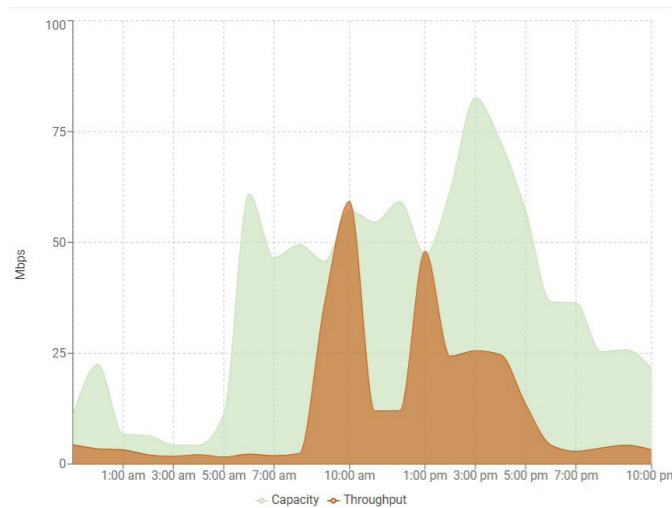


Fig. 8. Throughput and capacity of a mesh node deployed at ITU-Conference 2024 held in Uganda.

The eSIMs will eliminate the inconvenience and potential risk of losing or damaging the SIM; additionally, users will be in a position to effortlessly switch between various mobile network operators without the necessity of a physical SIM swap.

- Integrating fiber connectivity: The RENUMESH Technologies team is working on having fiber connections supported on the routers. This will offer extremely high bandwidth and low latency, improving overall network performance as compared to other last-mile technologies currently supported on the devices.
- Integrating LoRaWAN: LoRaWAN has revolutionized the way data is collected, transmitted, and processed from a wide range of applications. It has emerged as a popular choice for building low-power, long-range wireless IoT networks. RENUMESH Technologies is therefore working on integrating this module into the solar-powered routers to aid in collecting data and implementing IoT within the off-grid areas.

#### V. CONCLUSION

Solar-powered routers manufactured in Uganda by RENUMESH Technologies present an effective solution for providing Internet connectivity in underserved areas. These routers are particularly useful in off-grid regions and locations with unstable power infrastructure, such as the Lokopio Hills Technical Institute in the West Nile region and the African Rural University in Western Uganda. These routers can deliver sustainable and reliable Internet access by leveraging advancements in energy harvesting, power electronics, and off-grid systems. Continued innovation and investment in this technology will completely bridge the digital divide, fostering economic development and improving the quality of life in remote areas.

#### VI. APPENDICES



Fig. 9. Solar-powered router at Speke Resort Munyonyo.



Fig. 10. Solar-powered router installed at a university hostel.

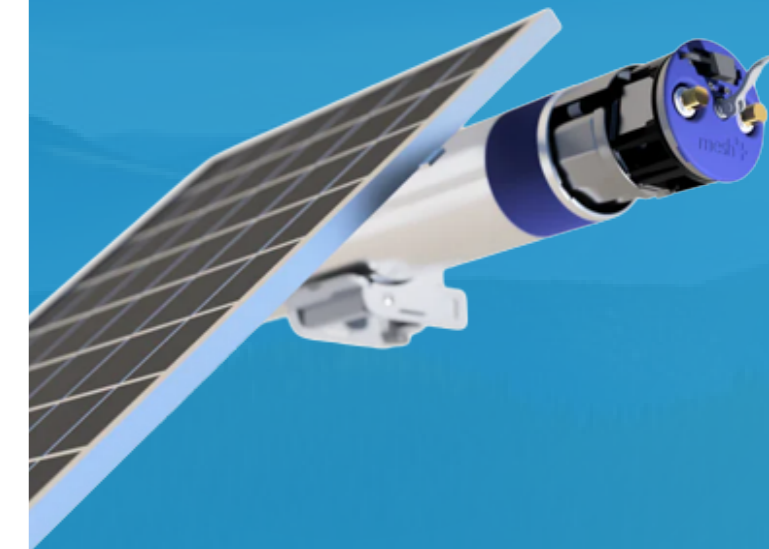


Fig. 11. Solar-powered router installed in the game park.

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# No Electricity? No Problem!



First **ROUTERS** made in Uganda





## Lokopio Hills Technical Institute Pioneering Connectivity with the RENU Solar-powered Internet Router

By RENU Communications Team

Lokopio Hills Technical Institute became a mark in RENU's history as the first client to adopt RENU's groundbreaking solar-powered Internet router, the first of its kind to be manufactured in Uganda, paving a greater way of bridging the digital divide that has faced the country for decades. This came as a result of a collaboration between the Research and Education Network for Uganda (RENU) and Cyber School Technology Solutions (CSTS), a premier provider of quality educational services that enhances the online educational environment globally. CSTS, through the Uganda e-Learning Initiative, supported by Mastercard Foundation, selected Lokopio Hills Technical Institute as one of the beneficiaries of the initiative, a step that culminated in the institute acquiring the solar-powered

router as a solution to the Internet challenges faced by the institute.

The institute, which is located 15 km from Yumbe town along Yumbe-Moyo Road in Northern Uganda, was established in 2016 by the Government of the Republic of Uganda under the Ministry of Education and Sports (MoES). It is one of the Other Tertiary Institutions (OTIs) in Uganda that equips students with the skills needed to transform lives and global communities. Such skills acquired by the students at the institute include; agricultural production, fashion and design, welding and metal fabrication, and building construction, among other things.

“Lokopio Hills Technical Institute, like most educational institutions in Northern Uganda, faces infrastructural challenges of unstable Internet connectivity and electricity that negatively affect the integration of technology to support education and research.

Lokopio Hills Technical Institute, like most educational institutions in Northern Uganda, faces infrastructural challenges of unstable Internet connectivity and electricity that negatively affect the integration of technology to

support education and research. The lack of stable Internet connectivity and electricity in such institutions of learning creates obstacles in the pursuit of academic excellence, and addressing these challenges is pivotal for the advancement of education in Uganda because it unlocks a world of knowledge, fosters innovation, and empowers the region's future generations. As part of the efforts to ease the situation, Cyber School Technology Solutions, collaborated with RENU in the early stages of the Uganda e-Learning Initiative, to provide affordable Internet connectivity and a suite of other ICT solutions, to seven Higher Education Institutions (HEIs) in Uganda, including Lokopio Hills Technical Institute.

“The solar-powered router is a beacon of hope for many institutions that are still grappling with connectivity challenges resulting from unreliable electricity, affordability, topography, physical access etc.

In July 2023, RENU partnered with Mesh++, a connectivity solutions manufacturer based in Chicago, USA, to manufacture the first solar-powered Internet routers in Uganda. The product can be accessed by all individuals who wish to have stable and affordable Internet access in their homes and businesses, without having to worry about cabling, unstable electricity, and monthly power bills.

The solar-powered router is a beacon of hope for many institutions that are still grappling with connectivity challenges resulting from unreliable electricity, affordability, topography, physical access etc. These routers are equipped with state-of-the-art solar panels that convert sunlight into electrical energy, which is used to power the router. This means that even students and educators in areas with unreliable electricity or where electricity infrastructure is non-existent, can enjoy uninterrupted Internet connectivity and access the digital world seamlessly.

In an insightful discussion with Andrew Muhairwe, the ICT Head of



RENU team with the solar-powered router.

Lokopio Hills Technical Institute in Yumbe district, the focus was on the transformative impact of the solar-powered Internet router solution on their Internet connectivity issues. The institute previously grappled with unstable Internet in the workshop area and parts of the administration block, a complete absence of Internet in the staff area, unstable power supply, and limited accessibility. Traditional methods had failed to address these challenges, making the introduction of the solar-powered router solution a game-changer. This innovative solution not only provided stable and constant Internet connectivity but also expanded its reach across the entire compound.

The most striking benefits included quicker Internet accessibility and improved overall access compared to the pre-existing setup. Given these significant improvements, Andrew emphatically recommended the solar-powered router solution for its ability to enhance Internet accessibility consistently and reliably. This endorsement underlines the solution's effectiveness in overcoming the institute's initial hurdles, showcasing its potential as a viable option for others facing similar challenges.

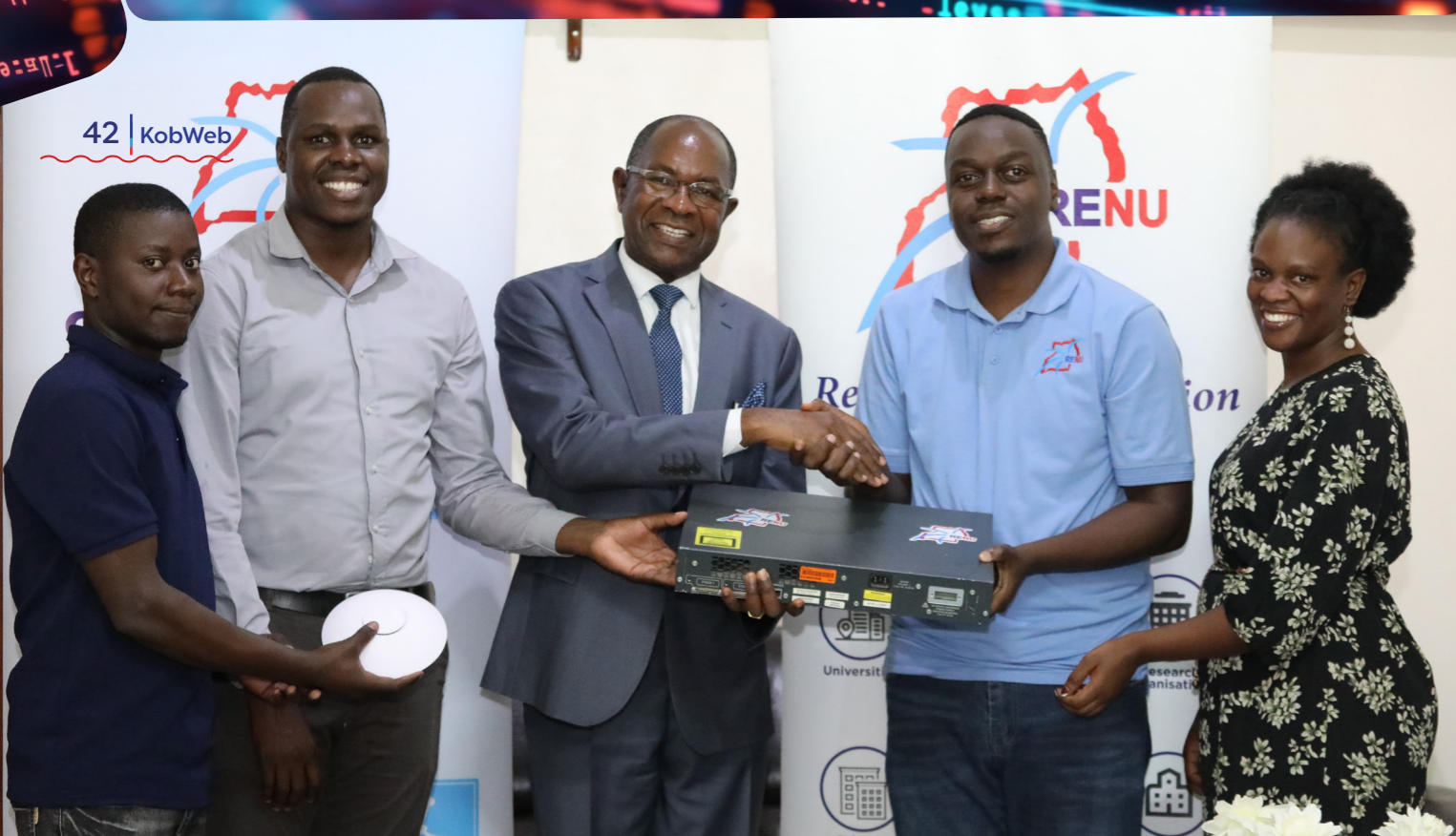
The routers have been strategically placed around the campus of Lokopio Hills Technical Institute, creating a robust wireless network that covers the entire institute. This network allows students to access online resources, engage in virtual learning, and connect with peers and experts from around the globe. Solar-powered routers have the ability to improve education and open doors to economic opportunities, innovation, and a brighter future for these students.

Brian Masiga, the Chief Executive Officer of RENUMESH Technologies stated that, "The focus of network operators and Internet Service Providers has traditionally centered on the backbone, which is equipped with high-end technology, reliable power backups, and redundancy at every level. However, the access network, which directly connects with customers and end-users, has often been neglected. This part of the network frequently suffers from low-quality equipment, lack of scalability, unstable power supply, substandard cabling, and non-compliance with established standards. While the significance of the backbone is widely recognized, the access network is equally vital for ensuring a seamless user experience.

The introduction of the solar-powered Node - S618 marks a transformative step in addressing these challenges in the access network. Designed with scalability in mind, one of its key features is its independence from traditional electricity sources and cabling, simplifying deployment and reducing infrastructure requirements. By supporting the backbone network, the S618 node ensures that the end-user experience is not compromised. This innovation eliminates the disparity between the backbone and the access network, offering a consistently high-quality experience to the end-users".

With the continuous adoption of the solar-powered Internet routers in Uganda and beyond, we are one step closer to a world where education and research know no boundaries.





# Introducing CNaaS to the Research and Education Community of Uganda A Tale of Global Collaboration in Networking Innovation by RENU and Sikt

By Caroline Tuhwezeine (RENU), Patience Nagaba (RENU) and Vidar Faltinsen (Sikt)

In a world increasingly interconnected through digital means, the importance of robust and reliable networks cannot be overstated. Across continents, organizations dedicated to advancing education and research are constantly seeking innovative solutions to meet the evolving needs of their communities. In November 2023, the Research and Education Network for Uganda (RENU) entered a twinning partnership with the Norwegian Agency for Shared Services in Education and Research (Sikt) to roll out Campus Network as a Service (CNaaS) in Uganda. In the spirit of collaboration and mutual growth, the partnership between RENU and Sikt stands as a shining example of international cooperation yielding tangible results.

The story begins with a bold vision: to bridge the geographical and technological gaps between Norway and Uganda, leveraging each other's strengths to pioneer a transformative

networking initiative. What ensued was a 6-month pilot project conducted under the auspices of GÉANT's National Research and Education Network (NREN) Twinning Program for GN5.2.

At the heart of this initiative lay the ambitious goal of establishing the new service, CNaaS, tailored to Uganda's unique context while drawing upon the rich expertise and experience of Sikt in Norway. This service is envisaged to transform many institutional Local Area Networks (LANs) by leveraging the expertise of the NREN technical staff, where an institution would outsource RENU to manage the set-up, monitoring, and management of the institution's campus network.

Despite the geographical distance separating the two countries, the teams from Sikt and RENU quickly forged a collaborative bond, united by a shared commitment to innovation and excellence.

“This service is envisaged to transform many institutional Local Area Networks (LANs) by leveraging the expertise of the NREN technical staff, where an institution would outsource RENU to manage the set-up, monitoring, and management of the institution's campus network.”

The journey was not without challenges. Budget constraints and equipment limitations threatened to derail progress, while concerns about job security loomed large for IT staff at partner institutions. Yet, it was precisely in the face of these challenges that the true spirit of collaboration shone brightest.

“One of the project's crowning achievements was the successful onboarding of Heritage International School as RENU's inaugural CNaaS client.”

Through regular touch-base meetings and face-to-face interactions, the teams navigated these obstacles with resilience and determination. Knowledge transfer workshops became a platform for sharing insights and best practices, fostering an environment of mutual learning and growth.

One of the project's crowning achievements was the successful onboarding of Heritage International School as RENU's inaugural CNaaS client. Despite initial apprehensions, the institution's enthusiastic embrace of the service underscored the school's potential to address longstanding network issues.

“When RENU came on board with CNaaS, the first thing that was addressed was the network security. The RENU team found out that there was unaccounted-for bandwidth that was



The Sikt and RENU teams visiting Heritage International School.

going out, which was solved in an instant. It was also discovered that most of our equipment was outdated and not doing what it was supposed to do, which the team helped us resolve as well. I have received great reviews from our end-users since we took on CNaaS!” said Kenneth Baguma, ICT Director, Heritage International School.

As the project drew to a close, reflections from both Sikt and RENU offered valuable insights into the transformative power of collaboration. Sikt acknowledges RENU's creative approach to problem-solving, while RENU expresses gratitude for Sikt's generosity in sharing expertise and resources.

Looking ahead, the partnership is poised for even greater heights. With

plans to expand CNaaS offerings through enhanced promotional activities, the teams remain steadfast in their commitment to advancing educational and research opportunities in Uganda and beyond.

Through initiatives like the Sikt-RENU partnership, we not only bridge geographical divides but also harness the collective power of global innovation to drive positive change.

Together, we can build a more connected and inclusive world!







## Campus Network as a Service (CNaaS) Experience from RENU Member Institutions

### Muteesa 1 Royal University

By Peace Hamba, Information Systems Manager

Muteesa I Royal University offers diverse academic and research programs, and as our institution grows, we face challenges related to network scalability, maintenance, and security due to the increasing number of users and devices, as well as expanding administrative demands. In addition to this, the institutional infrastructure was becoming outdated or obsolete, and we faced issues with scalability—many areas on campus were unreachable due to limited coverage. The surge in students bringing their own devices (BYOD) and an increase in staff members meant we needed a more robust and scalable network solution. The outdated infrastructure hindered reliable Internet access in certain parts of the campus, and this limited our ability to collaborate with other institutions. We couldn't tap into services like eduroam, which enables seamless Internet connectivity and collaboration between institutions.

To address these challenges, we adopted the Campus Network as a Service (CNaaS) solution from RENU. CNaaS has solved these issues by offering scalable network solutions, enhanced security, and the ability to easily integrate with global research networks. RENU's CNaaS provides us with comprehensive support, including network assessments, planning, and regular monitoring to ensure optimal performance and security. This proactive approach helps us mitigate cyber threats and maintain our network infrastructure with ease. We also appreciate the ongoing training RENU provides to our staff, which enables us to fully leverage the benefits of CNaaS.

One standout feature of CNaaS is its ability to foster collaboration. With eduroam integration, we can now connect with other RENU member institutions and participate in joint research initiatives. CNaaS also brings state-of-the-art equipment that

ensures reliable, high-speed Internet connectivity across our campus.

**For my fellow ICT staff, I encourage you not to feel overwhelmed by the introduction of CNaaS. The solution simplifies network management, allowing you to focus on higher-impact projects that drive your institution's growth. CNaaS reduces the workload for understaffed ICT departments by handling the heavy lifting, from monitoring to maintaining the network, all while ensuring excellent performance.**

As RENU usually says, CNaaS, indeed, has become your extra pair of hands in managing the network infrastructure. With CNaaS, we look forward to our university continuing to thrive with robust, scalable, and secure Internet connectivity.



## Campus Network as a Service (CNaaS) Experience from RENU Member Institutions

### Heritage International School

By Dr. Brychan Gilbert, Head of School

Over the last academic year, we entered into a very exciting partnership with RENU. This partnership has brought many advantages to our organization. We are a large international school and have been part of the international education scene here in Kampala for 30 years. Our commitment to having a strong foundation in technology, to support teaching and learning is very firm. International schools can experience a changeover of staff, and this can present challenges for continuity.

In the 2023-2024 academic year, we chose to partner with RENU, which undertook a comprehensive analysis of our school network. With RENU

support, we were able to eradicate the Internet connectivity challenges we were facing with the adoption of the Campus Network as a Service (CNaaS). Our network is now significantly more stable and this has had a positive impact on student's learning. We are now also confident that we have RENU on hand for expert support on issues where we require assistance.

This partnership has protected the continuity of the management of the network within our school. We are also seeking to expand a 'Bring Your Own Device' policy to increase the amount of technology in our school. We look forward to a continuing partnership with RENU as we pursue a technol-

ogy strategy that is compatible with our ambition, to be one of the world's leading International Christian schools.

**“With RENU support, we were able to eradicate the Internet connectivity challenges we were facing with the adoption of the Campus Network as a Service (CNaaS). Our network is now significantly more stable and this has had a positive impact on student's learning.”**





# Liberate your Mind from the Present and Dream Big to Provide Meaningful ICT Solutions for Research and Education! (Adapted from Dr. Francis Tusu's Speech)

By RENU Communications Team

At the 2024 RENU ICT Directors Forum, Dr. Francis F. "Tusu" Tsubira, the Chief Guest, delivered an electrifying address urging ICT leaders to dream beyond the present and shape the future of research and education. With the theme "Liberate your Mind from the Present and Dream Big to Provide Meaningful ICT Solutions for Research and Education," Dr. Tusu challenged the audience to reimagine their roles and responsibilities in the rapidly evolving landscape of ICT.

Here are key excerpts and insights from his transformative address:

"Anyone who thinks universities will be interested in Internet connectivity for a long time is mistaken. We need to

think about what is really needed. Beyond a good education and research output, there is national development. Our real objective should, therefore, be to impact national development." Dr. Tusu emphasized that ICT's role in higher education goes far beyond providing Internet connectivity. As developing countries rely on universities to uplift society, ICT leaders must look ahead to anticipate the evolving needs of their institutions.

### Science Fiction as a Guide to Innovation

One of the most striking elements of Dr. Tusu's keynote was his appreciation for science fiction as a source of inspiration. He cited the visionary works of Isaac Asimov, which predicted

concepts like big data and robotics decades before they became reality. "Science fiction isn't really fiction—it is minds liberated so they can think about possibilities and start creating reality. Leadership is about exciting people so that they can actualize their ideas."

**“As developing countries rely on universities to uplift society, ICT leaders must look ahead to anticipate the evolving needs of their institutions.**

Dr. Tusu called on ICT Directors to become visionaries who inspire teams to dream boldly and bring those dreams to life. He shared anecdotes from his career, including early dreams of 24/7 communication and boundaryless technology that seemed impossible at the time but are now everyday realities.

**“Don't focus on your university being poor because when you do, you are going to be perpetually poor. Dare to think big. Don't be limited by your current circumstances.**

### Freedom from Technology's Complexity

Dr. Tusu challenged ICT professionals to focus on benefits rather than the technology itself. He envisioned a future where technology becomes so intuitive that users interact with it effortlessly.

"I need a living assistant in the ICT environment. Why can't Artificial Intelligence carry out my research while I'm sleeping? Why can't I simply talk to my computer about research directions, and it responds with insights from around the world?" This future, he explained, requires ICT leaders to build environments tailored to user needs, eliminating barriers like passwords and complex interfaces.



Dr. Francis Tusu delivering his speech during the 2024 RENU ICT Directors Forum.

### The Role of Leadership in Empowering Teams

Dr. Tusu underscored the importance of empowering teams to innovate and learn from mistakes. Reflecting on his time at Makerere University, he shared his philosophy of granting autonomy to team members and supporting them unconditionally. "Allow your team to make decisions and mistakes, especially in the current environment, which presents opportunities for learning. Protect them when they make mistakes. Once you do this, your team will build your dream." He also emphasized the need for ICT leaders to redefine their roles and adopt a beginner's mindset to explore new possibilities and break free from the confines of expertise.

### A Call to Think Big

As a co-founder of the UbuntuNet Alliance, Dr. Tusu recounted how daring to think big led to significant advancements in research and education networks across Africa. He encouraged ICT Directors to embrace a similar

mindset. "Don't focus on your university being poor because when you do, you are going to be perpetually poor. Dare to think big. Don't be limited by your current circumstances."

### Looking Ahead

As he closed his remarks, Dr. Tusu left the audience with a powerful challenge; "Your challenge is to think beyond Internet connectivity. Step into the current future so that we can then dream about the bigger future." With a blend of visionary thinking, practical advice, and humor, Dr. Tusu's keynote speech resonated deeply with the audience, setting a bold agenda for the future of ICT in research and education.

Dr. Tusu's address is a timely reminder that the role of ICT in education is no longer just about solving technical problems but about shaping the future of learning, research, and national development. His visionary words provide both inspiration and a roadmap for ICT leaders to think beyond the ordinary and leave a lasting impact.







## How Big is Your Pipe? Advocating for the Future of Connectivity (Adapted from Prof. Ogot Madara's Keynote Speech)

By the RENU Communications Team

Prof. Ogot Madara, Executive Officer (CEO) of the UbuntuNet Alliance, delivered a deeply insightful keynote at the RENU 2024 ICT Directors Forum in Kampala, weaving personal anecdotes with a compelling vision for the future of education and research in Africa. With a focus on collaboration, capacity building, and equitable access, Prof. Madara challenged ICT leaders to rethink their roles and embrace the transformative potential of technology.

Reflecting on his connection to Kampala, Prof. Madara spoke of his pride in returning to the city of his birth. His address quickly transitioned into the heart of his message; the importance of networks—not only as infrastructure but as catalysts for innovation, collaboration, and progress. He highlighted the UbuntuNet Alliance's role

in connecting Eastern and Southern Africa, illustrating how regional networks like the Arab States Research and Education Network (ASREN), the West and Central African Research and Education Network (WACREN), and the UbuntuNet Alliance collaborate to link Africa to the global research and education community.

The UbuntuNet Alliance operates through the AfricaConnect Project, co-funded by the European Union and supported by member National Research and Education Networks (NRENs). Prof. Madara explained that these partnerships leverage economies of scale to deliver affordable, high-quality broadband connectivity. However, he noted that the benefits of these networks are not evenly distributed. While countries like Uganda and

Kenya have relatively stable Internet connectivity markets, landlocked nations such as Malawi and Zambia face significant challenges due to monopolistic providers. Prof. Madara shared examples of the Alliance's efforts to lower costs and improve access in these regions, and also demonstrated how the Alliance's work extends beyond Internet connectivity to fostering equity and inclusion.

Turning his attention to the institutional level, Prof. Madara posed a provocative question; "How big is your pipe?" For academic institutions to thrive in today's digital age, he argued, Internet capacity must be treated as a fundamental utility, akin to electricity. Adequate capacity is not a luxury—it is the baseline requirement for competing on the global stage.

“By advocating for better Internet capacity, fostering collaboration, and leveraging the full potential of existing tools, ICT leaders can redefine the role of technology in education and research.”

He urged ICT leaders to move beyond managing existing infrastructure and become advocates for what is possible. He shared a practical strategy for engaging institutional leadership; frame the conversation around outcomes. Instead of merely requesting increased bandwidth, articulate how it enables transformative initiatives, such as enabling researchers to access global resources, students to benefit from online learning, and faculty to collaborate internationally.

Prof. Madara illustrated this with an example from the University of Nairobi, which seamlessly transitioned to online learning during the COVID-19 pandemic. The institution negotiated with telecom providers to ensure students could access educational resources at no cost, while faculty adapted teaching methodologies to leverage digital tools. The result was not only uninterrupted education but also a long-term improvement in learning outcomes.

Prof. Madara also emphasized the transformative potential of digital repositories and virtual labs. Without



Prof. Ogot Madara delivering his keynote speech during the 2024 RENU ICT Directors Forum.

repositories, he noted, much of Africa's academic output remains invisible, depriving the continent of its intellectual legacy. He highlighted efforts to establish centralized repositories for cross-institutional and cross-country research, enabling greater visibility and collaboration. Similarly, virtual labs could address the disparities in physical infrastructure, allowing institutions with limited resources to access state-of-the-art facilities remotely.

One of the most compelling moments in Prof. Madara's address was his recounting of a historical project to rediscover a photograph of a colonial chief who championed education in Western Kenya. Using online archives and modern tools, researchers accomplished in two years what had eluded historians for decades. This anecdote underscored his central argument: access to technology and Internet connectivity transforms not only education and research but also cultural preservation and societal progress.

Prof. Madara concluded with a call to action for ICT leaders; think big and dream even bigger. "You are not just managers of technology. You are architects of possibility," he reminded them. By advocating for better Internet capacity, fostering collaboration, and leveraging the full potential of existing tools, ICT leaders can redefine the role of technology in education and research.

As his speech demonstrated, the question of "How big is your pipe?" is not merely about bandwidth. It is a challenge to envision a future where Internet connectivity is the foundation for a more equitable, innovative, and inclusive academic landscape.



## The True Value of Research and Education Networks (Adapted from Mr. Duncan Greaves' Keynote Speech)

By the RENU Communications Team

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While ISPs are profit-driven and design their networks for average usage, NRENs are mission-driven, with infrastructure designed to handle the peak demands of research and education.

Duncan Greaves, CEO of TENET in South Africa, delivered a keynote address at the RENU 2024 ICT Directors Forum that captivated the audience with its blend of insight, history, and practical wisdom. Reflecting on his extensive experience in research and education networking, Greaves shed light on the invisible yet transformative impact of National Research and Education Networks (NRENs), urging the audience to recognize their critical role in fostering innovation, collaboration, and long-term sustainability.

Drawing on Arthur C. Clarke's famous observation that "any sufficiently advanced technology is indistinguishable from magic," Greaves spoke about the tendency for ground-breaking technology to become ordinary over time. He illustrated this with the everyday brilliance of touch-sensitive screens and the seamless functionality of eduroam, emphasizing that the real value of technology lies not in its complexity but in the benefits it provides. For Greaves, this is the essence of what NRENs do—they deliver services that are indispensable to education and research, often without fanfare.

One of the most compelling distinctions Greaves made was between commercial Internet Service Providers (ISPs) and NRENs. While ISPs are profit-driven and design their networks for average usage, NRENs are mission-driven, with infrastructure designed to handle the peak demands of



Mr. Duncan Greaves delivering his keynote speech during the 2024 RENU ICT Directors Forum.

research and education. He explained how NREN services, such as uncontented bandwidth and advanced collaboration tools, enable universities and research institutions to tackle data-intensive projects that commercial networks simply cannot support.

Greaves emphasized that this distinction goes beyond technology. NRENs are built for collaboration, making it possible for researchers and educators to connect across institutions, regions, and even continents. He traced the roots of this collaborative spirit to the founding of the UbuntuNet Alliance in 2005, when a group of visionaries dared to imagine a network that would serve Africa's research and education needs. Today, he noted, this vision has grown into a reality that continues to drive innovation and progress.

Using the example of RENU, Greaves highlighted what he described as "one of Africa's most advanced NRENs," praising its ability to offer a broad range of services that extend beyond basic Internet connectivity. He called on the audience to reflect on the hidden value of these services and to resist taking them for granted. The absence of such infrastructure, he

warned, would be deeply felt.

"Price is what you pay; value is what you get," Greaves reminded the audience. He stressed the importance of balancing short-term pressures with a commitment to long-term sustainability, urging ICT leaders to advocate for the preservation and growth of their networks. The stakes, he argued, are too high to overlook. As universities face increasingly complex challenges, their capacity to collaborate—enabled by NRENs—will be essential in solving global issues, from health crises to climate change.

Greaves ended his address with a powerful call to action. ICT leaders, he said, must recognize and champion the unseen heroes of education and research—networks that quietly but indispensably power the academic and scientific advancements that define our age. By safeguarding and supporting these networks, institutions can ensure that they remain a cornerstone of progress for years to come.



## Ministry of Education and Sports Joins eduroam Interview with Dr. Jane Egau

By RENU Communications

The Ministry of Education and Sports (MoES) joined eduroam, the free, secure, and trusted Wi-Fi, in April 2024, marking a significant step toward enhancing digital infrastructure for Uganda's education sector. We spoke with Dr. Jane Egau, (then Undersecretary, Finance and Administration) to discuss the staff's personal experience with eduroam, its impact on the Ministry's operations, and the broader implications for education and research in the country. Below are excerpts from the conversation.

### What has been your personal experience with eduroam?

My experience with eduroam has been wonderful. Before using it, I relied on mobile data, which would often run out unexpectedly, causing frustration and interruptions. However, since I started using eduroam, it has been a game-changer—not just for me but for my family too. Initially, I used it only on my phone, but now it supports my entire household. I've set it up in a secure room, and it's on all the time, providing reliable Internet for everyone at home. In the past, I had to pay for separate Internet access for each person, but now we all share this resource

seamlessly. Occasionally, there have been minor disruptions—twice, to be specific—but the RENU team resolved them swiftly and without hassle. Their excellent customer care is a standout; I've been able to call for assistance or visit their headquarters, and they've always been responsive and helpful. This level of support has been incredibly reassuring.

### Now that the Ministry has eduroam installed in the boardrooms, what benefits do you envisage for the Ministry's officers utilizing this service?

Officers who have access to eduroam are already enjoying its benefits. However, there have been complaints about its limited availability, as it's currently installed only in specific areas, like the boardroom on the 8<sup>th</sup> floor. While this central location serves many during meetings, other officers are asking for it to be expanded to other parts of the Ministry. Expanding the network coverage would enhance access and usability across the entire Ministry.

### What is your view of the role of RENU as one of the partners pro-

### viding Internet in the Ugandan education sector?

We are very happy with RENU's contributions, especially to secondary schools. Initially, the focus was on universities, and I believe most universities are now connected and enjoying the service. They have no complaints and often recommend RENU's services. For secondary schools, the impact has been significant, but the reach is still limited. I look forward to the day when RENU's services are accessible everywhere, ensuring that no school is left out.

### In your view, how can continued collaboration with RENU contribute to advancing the Ministry's roles and achieving its objectives?

Our Ministry has developed a Digital Agenda Strategy for the Education and Sports Sector, which we are about to launch. This agenda highlights the critical role of Internet connectivity in achieving digital transformation. Without reliable Internet, it would be nearly impossible to implement the agenda effectively.



If RENU continues to expand its network to universities, secondary schools, and eventually primary schools, it will enable us to execute the digital agenda comprehensively. A needs assessment we conducted identified Internet connectivity as a major challenge, and addressing this bottleneck will significantly support our efforts to digitise education across all levels.

**What role do you see technology and digital infrastructure play in the future of education and research in Uganda, and how does the Ministry plan to stay at the forefront of these developments?**

Technology and digital infrastructure are at the heart of education's future in Uganda. Education is the foundation for everything else, so empowering teachers, students, and graduates with digital tools and skills is essential.

Our Digital Agenda Strategy aligns closely with the national Digital Transformation Roadmap launched by the Ministry of ICT and National Guidance. This strategy emphasises building digital infrastructure, enhancing digital skills, and ensuring Internet access for all educational institutions. By doing this, we aim to lead Uganda's digital transformation and prepare our citizens for a technology-driven future.

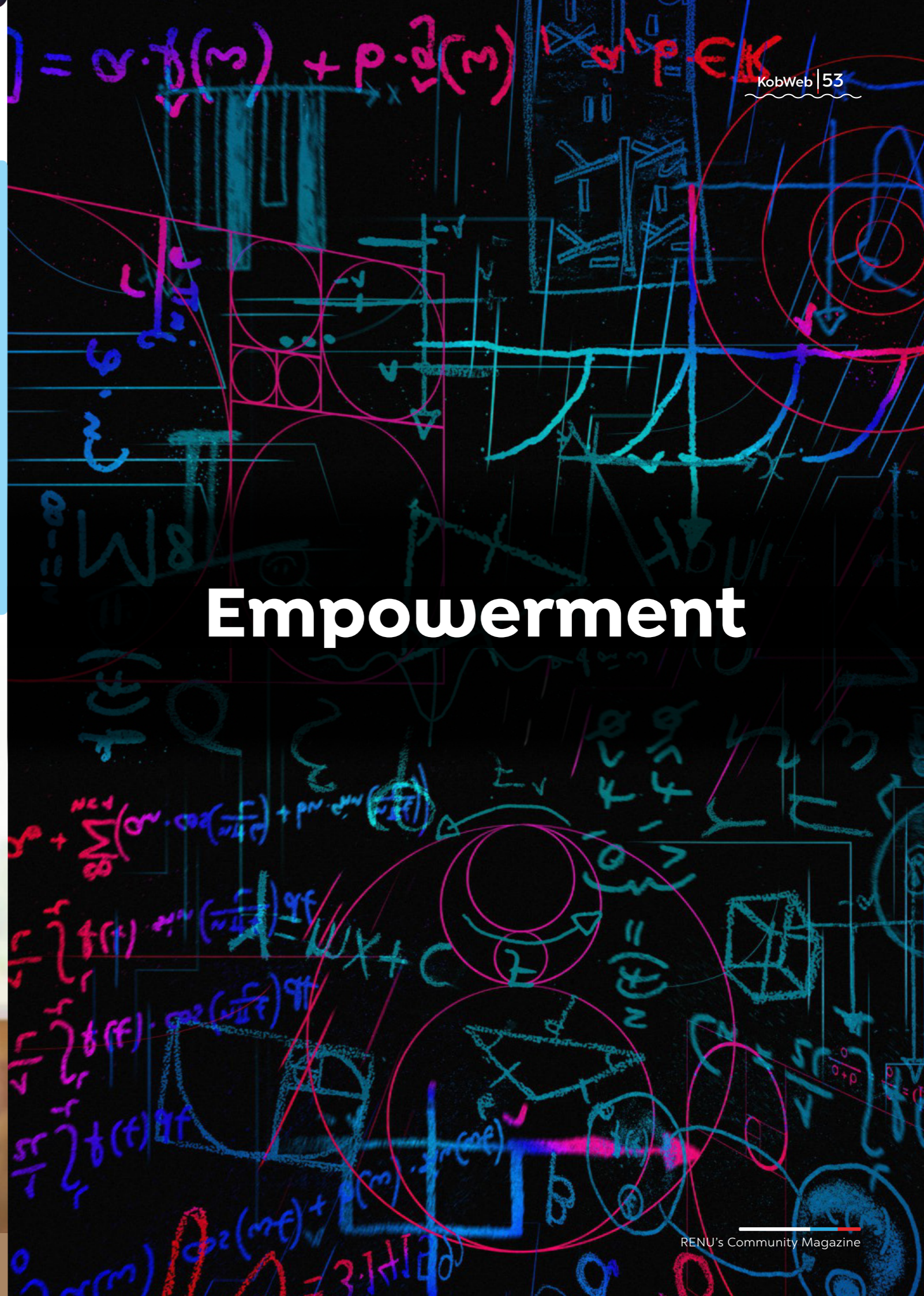
**What other innovations would you like to see RENU develop to support advancements in education and research?**

The top priority for now is the network expansion. RENU should strive to make its network accessible everywhere. By addressing this key bottleneck, we can pave the way for digital transformation in education. Once Internet connectivity is widespread, other innovations can follow, ensuring that the education sector continues to grow and evolve with the times.



**Our Ministry has developed a Digital Agenda Strategy for the Education and Sports Sector, which we are about to launch. This agenda highlights the critical role of Internet connectivity in achieving digital transformation. Without reliable Internet, it would be nearly impossible to implement the agenda effectively.**

# Empowerment







## Advancing Open Science and Open Access in Africa, with a Focus on Uganda

Open Science and Open Access have emerged as transformative movements in the global academic and research community. Their principles—sharing knowledge freely, fostering collaboration, and driving practical solutions to societal challenges—are especially resonant in Africa, where equitable access to resources and innovative solutions are essential for sustainable development. This article explores how Open Science and Open Access are influencing the research landscape across Africa, with a particular focus on Uganda.

By Dr. Johanna Havemann, Consultant and Trainer in Science Communication and Digital Science Management

The principles of education, technology, and empowerment underpin Open Science and Open Access, and are deeply connected with each other. Open Science promotes accessible and reproducible higher education by democratizing access and contribution to research literature, materials and equipment, enabling students, educators, and researchers to engage with the latest findings regardless of economic or geographic barriers. Technology serves as the backbone of these initiatives, with digital scholarly literature platforms like Baobab, the African Platform for Open Scholarship, AfricArXiv and institutional repositories leveraging digital tools to provide research dissemination platforms, thereby connecting researchers, sharing knowledge, and fostering collaboration across borders. Ultimately, this convergence empowers individuals and communities to address societal challenges, drive innovation, and build sustainable solutions tailored to local contexts. In Uganda and across Africa, Open Science is not just transforming research—it is catalyzing education, bridging technological divides, and empowering communities to shape their future through knowledge and collaboration.

### The Philosophy of Open Science and Open Access

At its core, Open Science aims to make scientific research, data, and outputs accessible to all, breaking down barriers imposed by traditional publishing models. Grounded in inclusivity, equity, and collaboration, the UNESCO Recommendation on Open Science provides guidance on how to make scientific knowledge accessible to all, dismantling barriers imposed by currently established systems of research and publication. For Africa, a continent rich in cultural diversity and intellectual potential, Open Science represents an essential framework for addressing societal challenges and driving sustainable development.

Open Access complements this by ensuring research articles and publications are available without subscription or paywall restrictions. Together, they democratize knowledge, allowing researchers from diverse backgrounds to contribute to and benefit from global scientific advancements.

The African research landscape has often faced challenges such as limited access to expensive journals, inadequate funding, and underrepresentation in global academic platforms. Open Science and Open Access provide a framework to overcome these barriers, empowering African researchers to share their work with a global audience while enhancing collaboration and visibility.

### Open Science in Africa: Building a Collaborative Knowledge Ecosystem

Africa has embraced Open Science with enthusiasm, driven by the need to address pressing issues such as health crises, climate change, food security, by embracing opportunities through enthusiasm on collaborative research and technological innovation. Organizations like the African Open Science Platform (AOSP), LIBSENSE (Library Support for Embedded NREN Services and E-infrastructure), the African Academy of Sciences (AAS), the Network of African Science Academies (NASAC), and the Association of African Universities (AAU) are at the forefront of promoting open frameworks for research across the continent.

Policies supporting Open Science have also gained traction. The African Union's Agenda 2063 emphasizes the role of science, technology, and innovation in achieving sustainable development. This vision aligns with Open Science principles, fostering a culture of transparency and inclusivity in knowledge creation. More specifically, several African countries have drafted and shared national and institutional policies to support Open Access and Open Science more generally. Examples of such countries include Ethiopia, South Africa, Botswana, Côte d'Ivoire, Ethiopia, Ghana, Lesotho, Mozambique, Nigeria, Somalia, Tanzania and Uganda.

Communities that support Open Science in and for the continent exist as

well in Kenya, Nigeria, Rwanda, Ghana, Cameroon, just to mention a few. Regional communities focus on certain aspect of Open Science such as The Africa Reproducibility Network (AREN), and Africa Open Science Hardware (AfricaOSH). The Kenya-based Training Centre in Communication (TCC Africa) provides capacity-building workshops and training for researchers on effective communication and Open Access publishing.

### Spotlight on Uganda: The National Research Landscape

Uganda exemplifies the transformative potential of Open Science in Africa. National interest and investment in Open Access is steadily growing since 2012, with key achievements to date, such as establishing and leveraging institutional repositories for increased discoverability through the adoption of persistent identifiers, institutional open access policies at five institutions, and open access journals published by eight universities.

Institutions like Makerere University are driving Open Science efforts by encouraging researchers to adopt open frameworks. The Uganda National Council for Science and Technology (UNCST) plays a critical role in setting research priorities and aligning them with national goals, often emphasizing the importance of collaborative and inclusive approaches.

Uganda has been piloting the use of Open Data to address food security and public health challenges. Initiatives like the Uganda Open Data Portal provide datasets on agriculture, demographics, and public health, enabling researchers to analyze trends and develop solutions collaboratively across the sectors of society. During the COVID-19 pandemic, Ugandan researchers leveraged Open Science platforms and repositories to share findings rapidly in order to provide access to critical data on infection rates, treatment outcomes, and public health interventions. Uganda's grassroots organizations and local Non-Governmental Organisations (NGOs) have embraced Open Science to address community-specific challenges. Projects focusing on sustainable energy, environmental conservation, and education are utilizing Open Access principles to share knowledge and engage stakeholders.

### The Crucial role of Research and Education Networks

National Research and Education Networks (NRENs) are critical in Africa for providing the technical expertise and digital infrastructure required to support research and education institutions. They ensure reliable connectivity, access to global research resources, and the facilitation of collaborative projects. Regional networks like WACREN (West and Central African Research and Education Network), ASREN (Arab States Research and Education Network), and UbuntuNet Alliance connect NRENs across Africa, enhancing regional and international collaboration. At the national level, networks such as ZAMREN (Zambia), iRENALA (Madagascar), EthERNET (Ethiopia) and RENU (Uganda) play pivotal roles in delivering high-speed Internet, fostering innovation, and driving capacity-building initiatives for their respective academic communities. Together, these networks create a robust ecosystem for advancing knowledge and development across the continent.

**“ In December 2024, the University of Cape Town hosted the 2<sup>nd</sup> Global Diamond Open Access Summit that concluded on a strong statement calling for non-commercial digital scholarly infrastructure to serve research dissemination treating knowledge as the public good that it is as postulated by the Human Rights Declaration, Article 27.**

### Overcoming Challenges and a Vision for the Future

Despite significant progress, the Open Science movement in Africa, including Uganda, faces significant challenges, such as funding gaps continuous financial support is essential for maintaining Open Access platforms and training programs, awareness and advocacy - many researchers and policymakers remain unaware of the benefits of Open Science, and infrastructure limitations - reliable Internet access and digital infrastructure are prerequisites for effective participation in Open Science.

To overcome these challenges, collaboration among governments, institutions, and international partners is essential. Institutional and national policies that prioritize Open Science, investments in digital infrastructure, and targeted awareness campaigns can accelerate progress.

The Open Science movement in Africa, exemplified by initiatives mentioned above and the efforts of Ugandan researchers, holds immense promise for transforming the research landscape. By embracing the principles of knowledge, community, and solutions, Africa is building a collaborative and inclusive academic ecosystem that addresses both local and global challenges. As the movement grows, the vision of a more equitable and accessible world of science becomes increasingly tangible. Through the use of platforms like AfricArXiv and the unwavering commitment of African researchers and institutions, the continent is not only contributing to global knowledge but also setting an example of innovation, resilience, and community-driven progress.

In December 2024, the University of Cape Town hosted the 2<sup>nd</sup> Global Diamond Open Access Summit that concluded on a strong statement calling for non-commercial digital scholarly infrastructure to serve research dissemination treating knowledge as the public good that it is as postulated by the Human Rights Declaration, Article 27.

### Dive Deeper into Open Science

- Read the Toluca - Cape Town Declaration on Diamond Open Access
- Explore the UNESCO Open Science Recommendation, <https://www.unesco.org/en/open-science>
- Join and explore the AfricArXiv Open Science Webinar Series, <https://info-africarxiv.ubuntunet.net/open-science-webinar-series>

### About the author

Dr. Johanna Havemann is a consultant and trainer specialising in Open Science Communication and Digital Science Project Management. As founder of Access 2 Perspectives and AfricArXiv, she enables researchers to share knowledge for societal impact as they advance their careers.

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## Demystifying the Role of University Communications Professionals in Catalyzing Social Development

By Joan Apio, Uganda Martyrs University (UMU)

In the realm of communication within African universities, the roles often appear to be reactive, detracting from the pivotal and strategic significance that communication professionals hold in the positioning of institutions, the ranking of universities, and the facilitation of strategic partnerships through skilful interventions that align with institutional goals. As universities increasingly engage in research, innovation, and technology for societal transformation, it has become increasingly imperative for university Communications professionals to incorporate development communication alongside their corporate and strategic communication efforts. This integration is crucial for effectively communicating and articulating development issues, demonstrating impact, and actively participating in the development process.

In light of this strategy, communication professionals from 12 African countries convened at the Hilton Hotel in Windhoek, Namibia, for a two-day strategic workshop titled "Strengthening the Capacity of University Communications Officers to Serve as Development Communication Professionals." This workshop was supported by the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) under the Mastercard Foundation TAGDev Program.

The workshop centered on strategic development communication applications, influencing narratives for strategic communications, monitoring, evaluation, and learning for the shaping of impact conversations, and storytelling for development communication. The workshop adopted a collaborative and co-creative learning approach, which

included brainstorming, consultative sessions, and reflective engagement. The participants, (the Communication Officers) developed enhanced capacities in articulating development contexts, reporting on the impact of development influence, and advancing the missions of their universities.

Recognizing the importance of collective action, the university Communications officers acknowledged the need to bridge the communication gap between universities and key development partners. As a consequence of the training, a Community of Practice (CoP) was established to facilitate the sharing of experiences and cross-learning among the institutions implementing the TAGDev Program. This initiative aligns with RUFORUM's strategy of facilitating networking among member universities, thereby creating opportunities and leveraging resources across the continent. The Communications officers were enthusiastic about the inclusive opportunity to engage strategically at the outset of the new agreement to scale up successes from the TAGDev 1.0 Project supported by the Vice Chancellors from African universities.

Following the successful implementation of the TAGDev 1.0 Project, RUFORUM, through the TAGDev 2.0 10-year project, aims to institutionalize and strengthen the capacities of the implementing universities to sustain these critical interventions within African universities. The experiences from the pilot-implementing universities – Egerton University in Kenya and Gulu University in Uganda – were instrumental in initiating discussions on the role of institutionalizing Communica-

tions within the TAGDev-implementing universities.

“As universities increasingly engage in research, innovation, and technology for societal transformation, it has become increasingly imperative for university Communications professionals to incorporate development communication alongside their corporate and strategic communication efforts.”

As the implementation of TAGDev 2.0 Project commences over the forthcoming decade, the role of university Communications officers will be pivotal in showcasing their significance in facilitating dialogue regarding the pivotal role universities play in the development agenda for Africa. This includes showcasing how African universities address pertinent issues such as quality teaching and research, the transition of young individuals into the workforce, the enhancement of employment prospects through entrepreneurship, and the training of ethical leaders who embrace an understanding of the development challenges faced across the African continent.

<https://ruforum.wordpress.com/2024/08/14/demystifying-the-role-of-university-communications-professionals-in-catalyzing-social-development/>

## Government and Universities Should Support WordPress Events

Emmanuel Angoda, Founder of TESI, Teacher, Lira Town College and Team Lead, Lira WordPress Community  
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Uganda has emerged as a hub for WordPress innovation and community engagement, hosting multiple WordCamps and NextGen events nationwide. These gatherings, hosted within Kampala to Jinja and beyond, are transforming Uganda's digital landscape, showcasing its vibrant tech community and positioning the nation among global leaders in WordPress events. The WordCamp Jinja 2024 and WordCamp Lira 2024 are just the latest examples of how these events are driving skill development, fostering innovation, and creating economic opportunities for youth and professionals alike.

Simply put, a WordCamp is a conference that focuses on everything related to WordPress. WordPress is a content management system (CMS) or publishing platform for building websites that powers 62% of all websites worldwide. According to internetlivestats.com, there are over 1.5 billion websites on the World Wide Web today.

WordCamps are usually informal and community-organized events put together by regular WordPress users. Speakers are selected from within the local WordPress community (or abroad) and have to speak about topics related to WordPress, website development, or

technology in general. Everyone, from casual WordPress users to developers, bloggers, designers, and content creators, can participate, share ideas, and get to know each other.

It should be noted that the first WordCamp was organized in San Francisco by Matt Mullenweg, the founder of WordPress, in 2006. Since then, local WordPress communities around the world have organized hundreds of WordCamps in different cities. In Uganda, there have been WordCamps in Kampala, Jinja, Entebbe and Masaka. I was the Team Lead for the recently held WordCamp Lira 2024, which happened to be the first in Northern Uganda. In Lira, attendees came from faraway places such as Kotido, Masaka, Entebbe, Kampala, Tororo, Gulu and Lango subregion.

“In 2022, Uganda featured among the top 50 countries with a high Online Service Index, which is in a major way related to the vibrant WordPress community.”

As you can see, there is a thriving and vibrant community of WordPress developers and users in Uganda. Consequently, Uganda is now highly ranked in the global WordPress community. In 2023 alone, Uganda held four WordCamps (in Jinja, Entebbe, Kampala, and Masaka) which placed Uganda in the 4<sup>th</sup> position globally. Spain held 10 camps, the United States of America (USA) held 9 camps, India held 6 camps, and the Philippines and Poland both held 3 camps. In 2024, Spain is leading again with 11 WordPress events, India has 8, USA has 6, and Uganda has 5 events. This, again, puts Uganda in 4<sup>th</sup> position globally.

Uganda's fourth-place ranking globally is a good achievement and should be celebrated. It also provides Uganda with several advantages, which, unfortunately, the Government of the Republic of Uganda doesn't seem to recognize and appreciate. For example, in 2022, Uganda featured among the top 50 countries with a high Online Service Index, which is in a major way related to the vibrant WordPress community. There are also a number of foreigners flying into the country to speak at these WordCamps. At the recently held WordCamp Jinja, four speakers were foreigners. This results in foreign activities that contribute positively to Uganda's economy.





In the last five years, the government has rightly stated repeatedly that ICT is one of the key pillars driving economic growth and employment, in addition to agriculture and tourism.

WordCamps are all approved and partially funded by WordPress Central. However, funding from WordPress Central is not enough (only about 60%), and there's a need to raise some revenue locally by getting local sponsors. This is where our government and universities should come in.

So far, the government has not supported this growth in the WordPress community. Yet several government officials (in the Ministry of ICT & National Guidance, Uganda Communications Commission, and NITA-U) and

university lecturers attend these events. In the last five years, the government has rightly stated repeatedly that ICT is one of the key pillars driving economic growth and employment, in addition to agriculture and tourism.

My view is that these globally recognized events and activities, such as WordCamps, should be supported financially because they serve as incubation centres and, within a short time, produce high-end web developers. Actually, universities should have more interest because these camps support their students and graduates by providing practical platforms for the beneficiaries to learn what they are unable to learn at universities. These events, in turn, provide novel knowledge and skills far ahead of rigid school and university curricula.

With more support, the ticket cost will come down (it is now about \$10), allowing more youth to attend and gain critical industry skills. WordCamp

attendees are mostly youth and students who go to learn practical skills, network with fellow tech enthusiasts, and later create their own digital jobs and businesses.

And lastly, just like we recognize those who win medals for our country at global sporting events, we should also recognize WordPress community leaders in Uganda. Rogers Mukalele, and Kateregga Muhammed (Jinja); Lawrence Bahiirwa, Joan Logose, and Sharon Norah Akol (Kampala); Arthur Kasirye (Entebbe); Moses Ssebuwufu (Masaka); Moses Cursor Ssebunya, and Denis Obote (Gulu); and yours truly (Lira), should be recognized and rewarded for the outstanding work they are doing for Uganda. These people are responsible for Uganda's 4<sup>th</sup> position globally in organizing WordPress events. At the very least, universities should use these individuals to inspire students pursuing ICT study programmes.



## Championing Africentric Solutions How Ahaki is Advancing Health and Human Rights in Africa

By Fatina Mwebe Atwine, Communications Officer, Afya na Haki (Ahaki)

Afya na Haki (Ahaki) is an African research and training institute that uses Africentric approaches to generate knowledge and enhance advocacy capacities in the areas of health, human rights, and Sexual and Reproductive Health and Rights (SRHR).

### What Sets Ahaki Apart?

Ahaki uses Africentric approaches to generate evidence and undertake advocacy capacity enhancement at national, regional, and global levels. We interpret Africentrism as finding African solutions to African problems by engaging Africans. Ahaki interprets Africentrism through the following lenses:

**a.** Positive African narratives: We amplify positive African narratives that advance the discourse on health, human rights, and SRHR by generating evidence-based knowledge. This research informs policy development, advocacy efforts, and programme implementation.

**b.** Engaging African institutions at regional and sub-regional levels: Through our regional department, we engage with African institutions such as the African Union (AU), East African Community (EAC), Southern African Development Community (SADC), and various Government Ministries, Departments, and Agencies (MDAs). We believe in the power of African institutions and their potential to influence policies on health, human rights, and SRHR. Through our engagements with these bodies, we help identify opportunities that contribute to policy decisions impacting African societies. We have established the Africa Reproductive Justice Litigation Alliance (ARJLA), a network of individuals, organizations, and coalitions committed to advancing reproductive justice through litigation.

**c.** Engagement with African NGOs: Our partnerships and Communications departments support and collaborate with African Non-Governmental Orga-

nizations (NGOs) to build accountable and sustainable organizations. We work to amplify African narratives and inform work on health, human rights, and SRHR. This is achieved through collaboration with various stakeholders, including government agencies, civil society organizations, academic institutions, and international development partners.

**d.** Engaging African individuals: Through our Advocacy Capacity Enhancement Department, we provide training and capacity-building programmes for individuals and organizations working in health, human rights, and SRHR. We have developed various training programmes, including the short course on "Advocacy for Reproductive Justice in Africa". This course equips participants with the skills and knowledge needed to advocate for reproductive justice.

Visit [www.afyanahaki.org](http://www.afyanahaki.org) for more information.





# My RENU DEA Experience at Ndejje University

By Jason Mutumba, Infrastructure and Networking Team Leader, Ndejje University DICTS



On January 8, 2024, I received an email from RENU confirming that Ndejje University had been offered Direct Engineering Assistance (DEA) for the first quarter of 2024. This was exciting for me as we would be receiving not only a networking equipment grant from the organisation but also support to deploy it quickly. The DEA was quite an interesting experience for us in the Infrastructure and Networking Team.

I chose to be part of the core teams as this would give me the ability to participate in the setup of the parts of the network, where the most significant changes would be implemented. During the discussions, I was impressed with the depth of knowledge and enthusiasm of the visiting engineers.

I was assigned the task of preparing the Network Address Translation (NAT) rules for the border gateway router, while the other two engineers were assigned the core tasks, including preparing other aspects of the gateway router and core switch configurations. One of the other Network engineers configured the distribution switch while also working with the others to prepare the access switch configurations.

The Ndejje University Infrastructure and Networking team that I lead, supported the RENU Network engineers in the preparation and deployment of the access switches. The RENU Systems engineers focused on setting up the services that we required to monitor and manage the network equipment. As the days went by, it became clear that the tasks would take longer than anticipated, yet time was running out. So, we often had to leave the Directorate of ICT offices quite late as the RENU engineers were determined to have the DEA completed on time.

Once the DEA week concluded, it was time for the RENU team to leave. It was a sour sweet moment for us as we had grown to start seeing them as colleagues and friends. We had spent

the week not only trying to revamp the university network with the new equipment that had been donated, but also growing our social networks through getting to know each other. After the RENU team left, we had some loose ends to tie up, which included setting up our Access Points (APs) to start using the Virtual Local Area Networks (VLANs) that had been set up during the DEA to segment the network. Our team managed to have this concluded after several days of hard work, sometimes consulting the RENU engineers when we needed some clarifications.

One of the greatest highlights for me was that the DEA enabled us to connect three locations at the main campus to the network. These were our Health Center, the students' dining hall, and one of the students' halls of residence. The users at these locations were very grateful for having Internet and eduroam services available to them.

Other benefits we gained from the DEA were the ability to remotely and securely access the main campus network using eduVPN, the ability to monitor the network devices on the Local Area Network (LAN) and automatic configuration backups of the network devices.

I am very grateful to RENU for the donation they made, not only in terms of the networking equipment but also the time and skill of their engineers invested in supporting us set up the university network in a short amount of time.



# My Experience as a Graduate Trainee at RENU





## My Experience as a Graduate Trainee at RENU

### Samuel Wekobosya

“The program is thoughtfully structured to allow trainees to engage in organizational activities under guided mentorship while also contributing to the community that RENU supports. It’s a hands-on experience where you learn by doing, facing challenges head-on, seeking solutions, and collaborating with others.”

The six months I spent as a graduate trainee at RENU were nothing short of transformative—a period that reshaped my professional journey, broadened my horizons, and laid a solid foundation for my career.

When I joined the program, I expected to sharpen my technical skills and gain exposure to the professional world. However, the experience far exceeded my expectations. Beyond technical growth, I learned critical skills in time

management, task prioritization, and navigating workplace dynamics. The Human Resource training sessions added an extra layer of value by offering insights that went beyond the workplace, enriching my understanding of professional and personal development.

The program is thoughtfully structured to allow trainees to engage in organizational activities under guided mentorship while also contributing to the community that RENU supports. It’s a hands-on experience where you learn by doing, facing challenges head-on, seeking solutions, and collaborating with others. The emphasis on teamwork, adaptability, and problem-solving has significantly bolstered my confidence and competence.

Being part of the Systems and Software Department, I was actively involved in nearly every aspect of the team’s work. Collaborating with experts who possess the skills I aspire to develop gave me invaluable insights into diverse perspectives and work styles. This exposure has been instrumental in shaping my approach to career development.

Reflecting on the six months, the difference in my skills and mindset is remarkable. The collaborative and welcoming environment at RENU creates the perfect space for growth, fostering a culture that encourages learning and innovation. I am walking away with not just improved technical abilities but also a clearer sense of purpose and direction in my career.

To anyone considering this program, especially undergraduates, my advice is simple; seize the opportunity and give it your all. The RENU Graduate Trainee Program is more than just an internship—it’s the start of a journey that will shape your career and open doors to a brighter future.

Looking ahead, I am confident that the skills and experiences gained at RENU will propel me toward achieving my goals. My heartfelt gratitude goes to the supportive, approachable, and knowledgeable team in the Systems and Software Department, who made every step of this journey enriching. For their mentorship and encouragement, I will always be grateful.



## My Experience as a Graduate Trainee at RENU

### Clinton Tumutonda

“The RENU Graduate Trainee Program not only advanced my technical skills but also transformed my outlook on leadership. Working with a mission-driven organisation gave me a profound appreciation for how technology can empower education and drive development, especially in under-resourced communities. Today, I am deeply committed to using my expertise to contribute meaningfully to Uganda’s digital transformation and beyond.”

My journey as a RENU Graduate Trainee was a turning point in my professional life, where theory met practice and innovation met impact. RENU’s program offered a unique opportunity to engage in real-world challenges while contributing to a mission that directly enhances the research and

educational ecosystem in Uganda. This experience has not only shaped my technical expertise but also deepened my sense of responsibility in leveraging technology for societal transformation.

From day one, I was entrusted with critical responsibilities, often in high-stakes environments where solutions had to be both immediate and sustainable. Whether it was setting up and optimising network infrastructure for academic institutions, designing scalable systems from the ground up, or troubleshooting network bottlenecks that affected hundreds of users, I quickly realized that each task had a direct and significant impact on the communities we served. This responsibility fueled my drive to deliver nothing short of excellence.

Mentorship was a core element of the program. Working alongside industry veterans, I gained invaluable insights into not just technical problem-solving but strategic thinking. I was encouraged to think beyond the immediate task at hand and to consider how every decision would impact long-term network reliability and operational costs. This perspective allowed me to balance innovation with practicality, ensuring that my solutions were both cutting-edge and sustainable.

Furthermore, the collaborative work culture at RENU taught me the impor-

tance of teamwork in large-scale deployments. Complex network configurations, high-stakes troubleshooting, and implementation of new technologies were achieved through a synergy of skills and knowledge sharing. This exposure refined my ability to communicate complex technical details in a way that stakeholders across various levels could understand, an essential skill for any engineer aiming to drive change.

The RENU Graduate Trainee Program not only advanced my technical skills but also transformed my outlook on leadership. Working with a mission-driven organisation gave me a profound appreciation for how technology can empower education and drive development, especially in under-resourced communities. Today, I am deeply committed to using my expertise to contribute meaningfully to Uganda’s digital transformation and beyond.

As I move forward, I am confident that the competencies, insights, and values gained from RENU will continue to guide my career. The Graduate Trainee Program has equipped me with the tools to lead, innovate, and make a lasting impact by turning connectivity into a force for progress.





**Rajjab  
Kabogoza**

As a Graduate Trainee, my time has been filled with invaluable learning opportunities, hands-on experiences, and personal growth in the field of networking. I've had the privilege of working on diverse projects that have helped me gain insights that have shaped my technical skills and professional abilities.

One of the key highlights of my training was the opportunity to apply theoretical concepts from my academic background to practical scenarios, gaining hands-on experience with a variety of networking devices and systems. I gained skills in configuring and managing hardware from multiple vendors, including Juniper routers, Mikrotik switches, CISCO switches, and firewalls like pfSense Netgate and Sophos. This practical exposure not only enhanced my technical capabilities but also expanded my knowledge on network security to better address performance optimisation and security challenges in RENU member institutions' networks.

During our training, we had the chance to learn and present on the various last-mile technologies used by RENU, such as fibre, microwave, and LTE. We also explored key routing protocols essential to our operations, including Interior Gateway Protocols (IGPs) like OSPF, RIP and Exterior Gateway Protocols (EGPs) like BGP. These presentations, along with interactions with the different members at RENU, significantly increased my confidence in communicating technically to large audiences.

Additionally, working directly with clients allowed me to develop strong skills in managing expectations, providing timely solutions, and maintaining effective communication. This combined experience not only enhanced my technical and problem-solving abilities but also enabled me to confidently deliver tailored, and reliable solutions in various operational environments.

Another key highlight of my experience was planning and organising the campus network at Mutesa I Royal University (MRU), Kampala through rolling out the Campus Network as a

Service (CNaaS). I also implemented dual stacking for the Islamic University In Uganda (IUIU), enabling two Internet Service Providers (ISPs) on one router and configuring load balancing between them. These projects were major learning milestones in my training, enhancing my decision-making skills and boosting my confidence in taking ownership of critical tasks while working collaboratively within a team.

Overall, my time as a Graduate Trainee has been transformative. I have grown technically, learned how to manage client relationships, and gained valuable project management experience. These skills, along with the support and guidance from RENU, have prepared me to thrive in the fast-paced and dynamic world of networking, and I look forward to continuing to build on this foundation as I advance in my career.

## My Experience as a Graduate Trainee at RENU



**Daphine  
Akankwasa**

The journey as a graduate trainee with the Research and Education Network for Uganda (RENU) was an enriching experience that left an indelible mark on both my personal and professional growth. It was more than just a role; it was a transformative phase where learning, challenges, and opportunities converged to shape my career trajectory.

From the very first day, I was immersed in a collaborative environment that encouraged innovation, adaptability, and critical thinking. The exposure to cutting-edge technologies and the mentorship from highly skilled professionals in the field provided a unique learning platform. These interactions not only deepened my expertise but also enhanced my ability to approach complex problems with confidence and creativity.

One of the most memorable aspects of my time at RENU was working on projects that had a direct impact on Uganda's education and research sectors. Witnessing the tangible outcomes of our work, connecting institutions, empowering individuals, and advancing research capabilities instilled in me a profound sense of purpose.

Equally transformative was the emphasis on soft skills development. Through workshops, teamwork, and diverse assignments, I honed my communication, leadership, and people management abilities. These skills have become invaluable assets as I navigate my current professional journey.

RENU's commitment to nurturing talent and fostering professional development was evident throughout my training. The structured programs, coupled with hands-on opportunities, ensured that I was well-equipped to tackle real-world challenges. This experience has laid a strong foundation for my career and continues to inspire me to strive for excellence in all my endeavours.

What truly sets the RENU Graduate Trainee program apart is its nurturing of a growth mindset. Every challenge presented an opportunity to learn, and every success was a testament to the support and encouragement of a cohesive team.

In retrospect, my time as a Graduate Trainee was more than just a stepping stone—it was a defining chapter in my journey. I am deeply grateful to RENU

## My Experience as a Graduate Trainee at RENU

for the foundation it provided, the networks it helped me build, and the values it instilled in me. The program didn't just prepare me for a career; it prepared me to make a meaningful contribution to society.





To those considering this journey or currently walking it, embrace every moment. The lessons learned, relationships built, and skills gained will undoubtedly shape your future in ways you cannot yet imagine.

Thank you, RENU, for the incredible opportunity to grow, learn, and lead.





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