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NEWSLETTER

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The Official Newsletter of the African Technology Policy Studies Network (ATPS)

ADVANCING SCIENCE AND TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT

COVER ARTICLES

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By Dr Chinwe Chukwudi and Susan Aquila Mburu

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ATPS Vision: To use Science, Technology, and Innovation (STI) as a means for achieving sustainable development in Africa

ATPS Mission :
To improve the quality of Science, Technology, and Innovation (STI) systems research, policy, and practice by strengthening the capacity for STI knowledge generation, dissemination, and use for sustainable development in Africa

Overall Objective:
To build Africa's capability in Science, Technology, and Innovation for sustainable development

ATPS Motto:
Building Africa's capabilities in Science, Technology, and Innovation policy research, policymaking, and policy implementation for sustainable development.

Inside:

Prof. Crispus Kiamba
Chairman, ATPS Board of Directors

Chairman's Message

As we approach the close of another eventful year, I am honoured to share a few reflections with you through this final edition of the Technopolicy Newsletter for 2025.

This year has reaffirmed, yet again, the indispensable role of science, technology, and innovation (STI) in navigating both opportunity and uncertainty across our continent. At the African Technology Policy Studies Network (ATPS), we remain steadfast in our purpose: to champion policies rooted in evidence, shaped by African realities, and designed to serve the public good. The resilience, creativity, and commitment demonstrated by our network of researchers, policymakers, civil society actors, the private sector actors, partners, and staff alike continue to inspire confidence in our shared mission.

In a world where emerging and frontier technologies are the order of the day, the need for thoughtful, inclusive, and forward-looking policy guidance has never been greater. The ATPS serves as a trusted convener, creating spaces where diverse perspectives come together to shape solutions that are not only technically sound but also socially just and economically viable.

As this year draws to a close, I wish to express my deepest gratitude to all our partners who have contributed directly or indirectly to the vitality and credibility of our ATPS Network. Your engagement strengthens our collective voice and amplifies our impact.

To all our readers, partners, and friends across Africa and beyond: may this Christmas season bring you peace, joy, and renewal. As we turn the page to 2026, I extend warm wishes for a New Year filled with good health, hope, and continued progress in your endeavours.

Let us carry forward the spirit of collaboration, integrity, and vision that has long defined the ATPS, and together, help shape a future where innovation serves all.

Prof. Nicholas Ozor
Executive Director, ATPS

Executive Director's Message

As we close another dynamic year, I am pleased to share a few highlights that reflect the African Technology Policy Studies Network's (ATPS's) growing momentum in advancing science, technology, and innovation for Africa's sustainable transformation.

I am especially delighted to announce that the ATPS has been awarded a **USD 900,000** grant from the **Carnegie Corporation of New York** to implement a project on "Advancing Responsible and Gender-Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem (ARISE)", which will run between 2025 and 2028. As the Principal Investigator, ARISE will support 10 doctoral and six postdoctoral fellowships across 49 Sub-Saharan African countries, catalyse the development of context-relevant Artificial Intelligence (AI) curricula, and inform inclusive AI policy frameworks at national and continental levels. This initiative builds on our earlier project tagged "**Managing Organization (Hub) for Responsible Artificial Intelligence for Agriculture and Food Systems (AI4AFS) Innovation Research Network in Africa" and the ongoing "Advancing Responsible Gender Equality and Inclusive Artificial Intelligence Innovations for Agriculture and Food Systems in Africa (AI4AFS+)**" Projects, and directly responds to the African Union's 2024 Continental AI Strategy, ensuring that Africa not only participates in, but actively shapes, the global AI discourse with equity and ethical responsibility at its core.

In October this year, I had the privilege of participating in the launch of the IDRC-STEP Change "**Strengthening the Capacity of the Extension System to use Proven Knowledge and Technologies to Sustain Equitable Locally Led Adaptation Among Smallholder Farmers (SCALE**)" Project in Podor, Senegal; a powerful demonstration of the ATPS's on-the-ground impact. Implemented in partnership with **Initiative Prospective Agricole et Rurale (IPAR)**. This locally led climate resilience program equipped farmers, extension agents, and researchers with integrated tools in climate-smart agriculture, digital weather forecasting, and ICT-enabled disease detection. With 60% of participants being women, the initiative exemplifies how inclusive, community-owned adaptation can drive scalable and sustainable change in the Senegal River Valley and beyond.

Earlier this month in December, the ATPS made a strong showing at the **Association of Commonwealth Universities (ACU)** Congress 2025 in Nairobi. During a key breakout session, I underscored the need for universities to serve as active architects rather than mere observers of societal transformation. I advocated for "Impact-First Innovation," Triple Helix collaboration, and the creation of Knowledge Exchange Offices to bridge the gap between research and real-world applications with the industry and policymakers. The Congress reaffirmed ATPS's role as a thought leader in linking higher education, innovation ecosystems, and policy to deliver measurable social outcomes.

These milestones are not ours alone; they belong to our partners, funders, researchers, communities, and the entire ATPS Network who continue to trust in our mission. As we step into 2026, ATPS remains committed to building a resilient, inclusive, and innovation-driven future for Africa.

Wishing you a peaceful holiday season and a prosperous New Year 2026.

Health Equity, Diagnostic Bias, and Scientific Colonialism in HAT Response

Dr Chinwe Chukwudi

Susan Aquila Mburu

*This article is written by **Dr Chinwe Chukwudi**, DVM, PhD, Deputy Director/Head of Research and Training, Vaccine Research Centre, University of Nigeria, Nsukka (UNN), and **Susan Aquila Mburu**, Communication and Outreach Officer at the African Technology Policy Studies Network (ATPS).*

***Dr Chinwe Chukwudi** is a veterinarian, molecular pathologist, and an enthusiast for NTD molecular epidemiology at the Vaccine Research Centre, University of Nigeria, Nsukka, where she leads research on zoonotic and neglected tropical diseases. She is a member of the African Technology Policy Studies Network (ATPS) and advocates for locally led, evidence-based health solutions across Africa.*

***Susan Aquila Mburu** is a Communications Specialist with a strong background in science communication. She specialises in translating complex scientific research into clear, accessible language.*

The article was written in collaboration with Dr Chinwe Chukwudi, whose groundbreaking fieldwork and advocacy on Human African Trypanosomiasis provide its scientific and ethical foundation.

Introduction

Human African Trypanosomiasis (HAT), commonly known as sleeping sickness, is a neglected tropical disease that continues to haunt rural communities across sub-Saharan Africa. Although global health agencies have declared significant progress toward its elimination, emerging evidence, particularly from Nigeria, suggests that the disease may be persisting silently, misdiagnosed, or dismissed due to rigid diagnostic protocols that fail to account for regional variation and clinical complexity.

This reality struck home during our investigation of a 17-year-old Nigerian boy who has suffered from uncontrolled seizures for over four years. Initially diagnosed with epilepsy and placed on toxic anti-epileptic drugs with no improvement, our team at the Vaccine Research Centre, University of Nigeria, Nsukka (UNN), in collaboration with the U.S. National Institutes of Health (NIH), began exploring alternative diagnoses in 2022. What we uncovered was compelling and deeply troubling.

A Case That Challenges Current Diagnostic Frameworks

The boy tested positive for trypanosomiasisacross four independent diagnostic platforms:

- ELISA
- Card Agglutination Test for Trypanosomiasis (CATT)
- Multiple PCR and qPCR assays (targeting various segments of the trypanosome genome)
- Amplicon sequencing, which confirmed the presence of trypanosome DNA from the Trypanozoon group

His cerebrospinal fluid (CSF) showed a white cell count of 435 cells/µL, well above the 5 cells/µL threshold for stage 2 (neurological) HAT. Brain MRI scans revealed multiple porencephalic cysts with gliosis, consistent with chronic neuroinflammatory processes. Critically, all members of his immediate family, including his parents and three surviving siblings, also tested positive on CATT and PCR. The boy and his three siblings had a chronic/recurrent febrile illness in infancy with elevated leucocyte counts from which he spontaneously recovered. Tragically, his younger brother died at age one from the febrile illness with extreme leucocytosis (40,000 cells/µL), a clinical picture now recognised as consistent with early-onset HAT.

When Robust Evidence Is Discounted

Despite this robust, multi-modal evidence, the case was dismissed by a WHO-affiliated reference laboratory based solely on a single negative trypanolysis test, a serological assay known to have limited sensitivity in strains of T. b. gambiense found in Nigeria and Cameroon due to the absence of the antigen type used in the test in trypanosome isolates from these areas. Notably, even the last officially recorded HAT case in Nigeria (2016), which was diagnosed in the UK, was also negative on trypanolysis using VAT Litat 1.3, yet was accepted as valid.

This double standard exposes a deeper, more insidious problem: scientific and health colonialism. When diagnostic authority is centralised in institutions that privilege one test over a constellation of clinical, molecular, and epidemiological evidence, especially when that test underperforms in specific geographic contexts, it perpetuates a system where African lives are deemed less worthy of thorough investigation or compassionate care.

The boy and his family cannot afford to travel to Europe for a “validated” diagnosis. They live in rural Nigeria, where access to basic neurology is scarce, let alone specialised parasitology services. Yet, he is denied even a therapeutic trial of fexinidazole, the WHO-recommended oral treatment for both stages of gambiense HAT. Fexinidazole is less toxic than the anti-epileptics the boy has endured for years and far safer than the multiple brain surgeries now being proposed to remove his cysts.

In medicine, when diagnosis is uncertain but clinical suspicion is high, therapeutic diagnosis is a recognised and ethical approach. Denying it in this case is not just a scientific oversight; it is a moral failure.

Nigeria has long been labelled "HAT-free" based on surveillance gaps, not evidence. Our research suggests otherwise. If we continue to rely on outdated assumptions and inflexible diagnostic hierarchies, we risk missing and mismanaging cases that could reignite transmission or cause irreversible neurological damage.

Rethinking Elimination Narratives and Global Health Practice

While the concerns raised in this case are deeply valid and warrant urgent attention, it is also important to acknowledge the complexities and constraints that shape global health decision-making, particularly in the context of disease elimination programs like the one for Human African Trypanosomiasis (HAT).

The World Health Organisation and its partners have made extraordinary progress in reducing HAT cases from tens of thousands annually in the late 1990s to fewer than 1,000 reported cases globally in recent years. This achievement has relied on standardised diagnostic algorithms designed to minimise false positives, which are critical when dealing with a disease that requires toxic, complex treatments and when surveillance and response resources are minimal. In these contexts, confirmatory tests such as trypanolysis, despite their known limitations, are used as a safeguard to ensure treatment is given only where the diagnosis is unequivocal.

Moreover, global health institutions operate within tightly regulated frameworks that govern drug safety protocols, pharmacovigilance requirements, and ethical guidelines, often restricting the use of medications like fexinidazole outside confirmed cases. These protocols are not intended to deny care but to prevent unintended harm, such as drug resistance, adverse reactions, or the misallocation of scarce medicines, in settings with weak monitoring capacity. The challenge lies in adapting these global standards to local realities without compromising patient safety or public health integrity.

It is also worth noting that diagnostic science is evolving. The limitations of current serological tools in West Africa are increasingly recognised, and efforts are underway, often in collaboration with African researchers, to develop more sensitive, field-applicable molecular and antigen-detection assays. The case described here could serve as a powerful catalyst to accelerate those innovations and revise diagnostic guidelines to reflect regional parasite diversity and clinical presentations better, especially as HAT enters its "elimination of transmission" (zero cases) phase.

Ultimately, the path forward lies not in opposition, but in partnership. African scientists, global health agencies, and national programs must work together to co-develop context-sensitive diagnostic and treatment protocols that balance scientific rigour with compassionate, equity-centred care. Only through such collaboration can the gains against HAT be sustained, and the risk of leaving vulnerable patients behind be truly eliminated.

Building Climate-Resilient Futures Through Inclusive Extension Systems in Nigeria and Senegal

Written by Engr. Prof. Joel Nwakaire, a Senior Research Associate at the African Technology Policy Studies Network (ATPS), Nairobi, Kenya. He is currently the Artificial Intelligence for Agriculture and Food Systems Innovation Research Network program officer at the ATPS and a Professor in the Department of Agricultural and Bio-resources Engineering at the University of Nigeria, Nsukka.

Engr. Prof. Joel Nwakaire

Joel Nwakaire has worked for 16 years as a lecturer in the Agricultural and Bioresources Engineering Department at the University of Nigeria, Nsukka. He obtained his PhD in 2013, and the product of his thesis was nominated as one of the five most innovative works in Africa during the maiden edition of the Innovation Prize for Africa. Joel Nwakaire won an award as the best serving National Youth Service Corps member in the 2005 batch A in Nassarawa state. His Master's project on the design, construction and testing of a 30 litre per hour continuous biodiesel plant won first prize in the all-African Young Professional in Science competition in 2009. His publications have focused on biofuels, waste utilisation, agricultural machinery, and energy management.

From Knowledge Gaps to Knowledge Bridges: SCALE Delivers Measurable Change in 2025

Eighteen months ago, smallholder farmers in southeast Nigeria and the Senegal River Valley were still grappling with the same familiar constraints: limited access to timely climate information, outdated pest management practices, low adoption of digital tools, and extension systems stretched too thin to reach everyone who needed them. Today, the picture is dramatically different. Between April and October 2025, the SCALE Project — implemented by the African Technology Policy Studies Network (ATPS) in partnership with IPAR (Senegal) and WAGEDI — completed the most intensive phase of its work to date. The results are not just encouraging; they are transformative.

On 12–13 August in Abakaliki, Ebonyi State, and 18–19 August, 2025 in Nsukka, Enugu State, 307 stakeholders in Nigeria underwent foundational capacity-strengthening training and recorded an average knowledge increase of 33 percentage points — from 45% pre-training to 78% post-training. 184 of those participants were women (60% of total attendance).

90% of all participants reported significantly improved understanding of gender-inclusive climate adaptation. Extension agents and researchers are collectively committed to reaching an additional 500+ farmers with real-time climate advisories using digital platforms established during the training itself.

During the Phase 1 Capacity-Strengthening Training in Podor, Senegal (October 22-23, 2025), 178 stakeholders—150 farmers (60 women, 90 men), 44 extension agents (12 women, 32 men), and 34 researchers (16 women, 18 men)—demonstrated a remarkable shift in capabilities. Pre-training knowledge scores averaged 49%, soaring to 85% post-training (+36%). Participants mastered digital tools for weather forecasting and disease detection, climate-smart livestock practices, budgeting for resilient investments, and GESI-responsive research. Farmers committed to adopting at least three practices (e.g., drought-tolerant crops, agroecology), while extension agents pledged to reach 500+ additional farmers via WhatsApp groups for real-time advisories.

This directly showcases enhanced capacity for locally led adaptation, as actors co-designed solutions blending local knowledge with technologies, fostering inclusive implementation. This capacity building is highly significant as it addresses Senegal's erratic rainfall and low extension ratios by empowering marginalised groups (women at 49% attendance) to lead resilience. It bridges systemic gaps, boosting productivity and equity in the Senegal River Valley.

In Nigeria and Senegal farmers, extension agents, and researchers were trained across seven co-developed modules drawn from the co-identified needs. The training areas where:

1. Digital Platforms & ICT for Climate Advisory Services
2. Climate-Smart Agriculture Practices
3. Climate Financing and Grant Proposal Writing
4. Gender Equality and Social Inclusion in Adaptation
5. Collaborative Problem Prioritization
6. Inclusive Design Pathways
7. Knowledge Brokering and Community of Practice Development

The numbers tell part of the story. The stories behind the numbers tell the rest. Participants didn't just sit and listen. They operated AI-powered crop disease diagnostic apps (Plantix, APWEN Farm, on-farm 2-class AI detectors). They tested SMS-based smart irrigation systems and advanced NPK soil sensors. They wrote real grant proposals. They role-played conflict resolution scenarios over water access. And crucially, they separated into gender-specific groups to surface needs that mixed sessions had previously obscured. Mrs. Chinyere Eze, a pepper and tomato farmer from Eziani community, Nsukka, spoke for many when she said:

> *Before now, I thought technology was not for women like me. But when I used the phone app to diagnose blight on my tomatoes in less than one minute, I almost cried. I saved that entire bed of crops. Now I teach my neighbours — men and women — how to use it. The extension agents said they will keep sending us alerts on the WhatsApp group they created during the training. This is the first time I feel the knowledge is truly ours.*

The pre- and post-training assessments were rigorous. The results were startling. The highest knowledge gain (+40%) came in Module 2: Smart Agriculture Practices — exactly the area farmers had identified as their top priority during validation workshops six months earlier. Perhaps the most powerful outcome was not captured in percentages at all. On the final day in Nsukka, farmer participants — led by women from the Nwanyi Bu Ihe Cooperative — stood up unprompted and demanded the creation of a formal, biannual platform for co-designing technologies with researchers and extension agents. One male extension agent admitted afterwards: "We always thought we were bringing knowledge to farmers. Today the farmers showed us that without their leadership, our knowledge is useless."

That single moment crystallised everything SCALE has been working toward: a fundamental shift in power dynamics within the Research-Extension-Farmer triad.

Senegal: From Policy Gap to Policy Opportunity

In Senegal The SCALE team spotted something even rarer — a genuine policy window. For decades, Senegal has operated without a comprehensive national agricultural extension policy. Extension services have been fragmented, underfunded, and overwhelmingly male-dominated (only 12% of agents are women). Climate adaptation and gender equality have been treated as add-ons rather than core principles. In mid-2025, the government established a national technical committee to finally develop the long-awaited National Agricultural Extension Policy (NAEP). As this newsletter goes to press, the SCALE Senegal team is already embedded in the technical committee, providing evidence briefs, facilitating stakeholder consultations, and drafting specific policy language. If successful (and early indications are extremely positive), the new NAEP will institutionalise everything SCALE has been piloting at the community level: women's leadership in adaptation planning, digital knowledge brokering, and farmer-led innovation. In other words, SCALE will have moved from strengthening individual actors to strengthening the entire national system.

Gender Equality and Social Inclusion: No Longer an "Add-On"

The numbers are worth repeating: 184 women participated in the Nigeria training, 60% of total attendance, while in Senegal, 88 women participated, a significant 49% of stakeholders. This was not accidental. From the very beginning, SCALE adopted the "safe space" methodology validated in earlier workshops: separating men and women during needs identification to ensure women's priorities (financial literacy, non-chemical pest management, leadership skills) were not drowned out by male voices.

The results have been profound; 90% of all participants — men and women — reported significantly improved understanding of gender-inclusive adaptation. Extension agents who previously saw gender training as a "soft" topic now champion it as essential for effective service delivery.

One young female extension agent from Ebonyi State summed it up:

> *I used to think my job was to teach farmers new seeds or fertiliser schedules. Now I understand my real job is to make sure women farmers can actually access and control those seeds and fertiliser. Without that, nothing else matters.*

The project is now deliberately shifting GESI efforts from project-level training to systemic policy change through the Senegal NAEP process — ensuring that future generations of extension agents will be recruited, trained, and evaluated with gender equality as a core competency.

Digital Transformation: WhatsApp Today, ICE Platform Tomorrow

One of the most immediate outcomes of the Nigeria training was the spontaneous creation of multiple WhatsApp groups linking farmers, extension agents, and researchers in real time.

Within weeks, these groups were already sharing:

- Early warning alerts for fall armyworm outbreaks
- Market price updates for cassava and maize
- Photos of crop diseases with instant AI-assisted diagnoses
- Success stories of upcycled plastic pest shields (the innovation that achieved 100% protection in 2025 pilots). The unique LLA innovation is shown in Figure 1.

Figure 1. Proven Knowledge for protection against stem-cutting ants

Extension agents report that they can now reach 10–20 times more farmers than before, bypassing the physical constraints of the 1:5,000 agent-to-farmer ratio. This organic adoption of digital knowledge brokering is exactly the proof-of-concept needed for the Interactive Collaborative Environment (ICE) platform that has been established by ATPS and partners to be fully operational.

A Model for Africa and Beyond

The SCALE Project is no longer just a capacity-building initiative. It has become a living laboratory for how to make locally led adaptation genuinely equitable, digital, and systemic.

From women in Nsukka leading the co-development of pest-control innovations using upcycled plastic waste, to extension agents in Ebonyi using WhatsApp to save entire harvests from disease outbreaks, to national policymakers in Dakar citing SCALE evidence as they draft new laws — the proof is in the outcomes.

As Professor Nicholas Ozor, SCALE Project Director, said in his closing remarks at the Nsukka training:

> *We came to strengthen the extension system. Instead, the farmers, women, and young people have shown us what a truly strong extension system looks like: one that listens, co-creates, and follows community leadership. The system is not broken. It was just waiting for the right people to take charge.*

Project Title: Strengthening the Capacity of the extension system to use proven knowledge and technologies to sustain equitable Locally Led adaptation among smallholder farmers (SCALE)

The SCALE Project is funded by the International Development Research Centre (IDRC) through the Step Change initiative, with support from the Governments of Canada and the Netherlands.

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The Imperative of Higher Education for Africa's Developmental Transformation

Written by Dr Thabo Ndlovu, Senior Research Fellow, Centre for Higher Education and Development, University of Cape Town, South Africa.
Dr Thabo is a Senior Research Fellow at the Centre for Higher Education and Development (CHED), University of Cape Town, South Africa. His research focuses on equity, innovation systems, and education policy in the Global South, with a particular emphasis on the role of higher education in driving inclusive development, structural transformation, and democratic governance across Africa.

Dr Thabo Ndlovu

Africa stands at a critical juncture in its developmental trajectory. With a youthful population—over 60% under the age of 25 (UNDP, 2022)—the continent possesses immense human capital potential. Yet, realizing this potential hinges critically on the expansion, quality, and relevance of higher education. Far from being a mere privilege, higher education is a strategic engine for economic diversification, technological innovation, democratic consolidation, and social equity. In this article, I argue that investing in and reforming higher education systems across Africa is not optional but foundational to achieving the Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth).

Historical Legacies and Structural Constraints

Historically, African higher education institutions were designed to serve colonial administrative needs rather than foster indigenous knowledge or drive local development (Mamdani, 1990). Post-independence, many African states expanded access to universities, but systemic challenges—including chronic underfunding, outdated curricula, and weak links to industry—have constrained their transformative capacity. Today, while enrolment has grown significantly, with tertiary gross enrolment ratios rising from 4% in 1999 to nearly 11% in 2021 (World Bank, 2023), this expansion has often occurred without corresponding investments in infrastructure, faculty, or research capacity.

The economic case for higher education is compelling. A study by Oketch et al. (2020) found that each additional year of tertiary education in sub-Saharan Africa yields an average return of 17% in increased earnings—significantly higher than global averages. More importantly, university graduates are more likely to innovate, start businesses, and contribute to structural transformation. In Rwanda, for instance, the government's strategic investment in science, technology, engineering, and mathematics (STEM) education has catalyzed growth in its burgeoning ICT sector, which now contributes over 3% to GDP (MINICT, 2022). Similarly, South Africa's National System of Innovation relies heavily on its research universities to drive advancements in renewable energy, biotechnology, and digital finance.

Reimagining Higher Education for Inclusive and Sustainable Development

Beyond economics, higher education nurtures democratic citizenship and social cohesion. Universities serve as spaces for critical discourse, civic engagement, and the incubation of ethical leadership. As Mkandawire (2015) observes, "Development is not just about GDP; it is about the quality of institutions and the character of public discourse." In countries like Ghana and Botswana, universities have played pivotal roles in fostering transparent governance and anti-corruption advocacy through public policy research and community outreach.

However, persistent inequities threaten to undermine these gains. Access to higher education remains skewed along lines of gender, geography, and socio-economic status. Rural students, women in STEM fields, and learners with disabilities face disproportionate barriers. Furthermore, the commodification of education through cost-sharing policies—while sometimes necessary—risks excluding the most vulnerable. As Teferra (2018) warns, "Without deliberate equity measures, higher education can reinforce rather than redress social stratification."

To address these challenges, African governments must adopt a multi-pronged strategy. First, public investment in higher education must increase. Currently, many African countries allocate less than 0.5% of GDP to tertiary education—far below the 1–2% recommended by the African Union's Continental Education Strategy for Africa (CESA 16–25) (AUC, 2016). Increased funding should prioritize faculty development, digital infrastructure, and research grants aligned with national development priorities.

Second, curricula must be decolonized and contextualized. This means integrating indigenous knowledge systems, emphasizing problem-based learning, and strengthening partnerships with industry and communities. The African Research Universities Alliance (ARUA), for example, promotes collaborative research on climate resilience, urbanization, and health—issues directly relevant to the continent's future.

Third, regional integration must be leveraged. Initiatives like the African Continental Free Trade Area (AfCFTA) demand a mobile, skilled workforce. Harmonizing academic qualifications through the African Higher Education Area—modeled after the Bologna Process—can facilitate student and labor mobility while raising quality standards.

Critics may argue that primary and secondary education should take precedence. While foundational education is vital, it is not a zero-sum game. As Yusef (2021) contends, "A ladder cannot be climbed if only the bottom rungs are built." Higher education trains the teachers, engineers, doctors, and policymakers who, in turn, strengthen lower education tiers and public services.

In conclusion, higher education is not a luxury for Africa—it is a necessity for sustainable, inclusive, and self-determined development. As the continent navigates the complexities of the 21st century, its universities must be reimagined as hubs of innovation, equity, and African agency. The path forward demands political will, strategic investment, and a renewed commitment to knowledge as a public good. Only then can Africa fully harness its greatest resource: its people.

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Isaac Kaba, research focuses on developing novel chemical tools to modulate immune responses and address cancers, inflammation, and autoimmune diseases

Isaac Kaba

In this issue, we feature Isaac Kaba, a Doctoral Candidate at UC Berkeley. His research focuses on developing novel chemical tools to modulate immune responses and address cancers, inflammation, and autoimmune diseases. Isaac's work has earned several prestigious recognitions, including the Pioneer Award (2023), the Kim Graduate Fund (2024), and the GEM Fellowship (2025).

Q Could you briefly introduce yourself and tell us what inspired your passion for science, particularly drug discovery and chemistry?

A Sure. I'm currently a Chemistry PhD Candidate at the University of California, Berkeley. I'm originally from Kinshasa, in the Democratic Republic of Congo – right in the heart of Africa. To begin, I think I first became really attracted to science when I was in high school back in Kinshasa. I had an amazing chemistry teacher, and in fact, my intro to organic chemistry course was in high school. Then, I became more interested in therapeutic discovery due to the observation that my grandparents and most people in the community I grew up in frequently use herbal plants to treat common discomfort and diseases. I was really intrigued and became curious to explore the "magic", I would say the chemistry, behind these traditional plant-based medicines. This experience compelled me to pursue undergraduate studies in Pharmaceutical Sciences at the University of Kinshasa. There, I conducted my first research in medicinal plant chemistry, working on the identification of groups of bioactive compounds from these herbs as potential drugs. That's where my passion for drug discovery started.

Q Your journey from Kinshasa to Berkeley is quite remarkable. What were some of the biggest challenges and lessons you encountered along the way?

A One of the biggest challenges was COVID-19, which nearly derailed my academic pursuits at the University of Kinshasa. With the onset of the pandemic, I was unable to access my courses in Kinshasa. My studies were deferred for almost two years. I took a hiatus from college due to the limited technical capabilities for hosting online classes in the country. Not one to sit idle, I was doing some hands-on research on medicinal plants used to treat diseases in Kinshasa during the lockdown. In the meantime, I was seeking opportunities to transfer from Kinshasa to the U.S to complete my degree program in pharmaceutical sciences and pursue research ambitions. The process was tough.

I reached out to multiple schools in the U.S. I was even told that undergraduates from our part of the world have a less than 10 percent chance of being transferred to study in the U.S. Getting my transcripts translated from French into English and navigating an entirely new system was very uncertain. But still, I was persistent. I ended up being admitted as an international transfer student to the U.S. after the evaluation of my academic credentials. I was really determined to continue my studies. That paid off. I was awarded a competitive International Rocket Scholarship and other funding, which allowed me to complete my pharmacy program at the University of Toledo before moving to Berkeley, where I am now pursuing a doctorate in chemistry. And certainly, my passion for drug discovery was fuelled at the Center for Drug Design and Development at the University of Toledo. I had exceptional research training in drug design, synthetic medicinal chemistry, and chemical biology during my time at UT. An important lesson I've learned from my case is that hurdles were opportunities to grow as a scientist, build resilience, and become capable of engaging in an international scientific ecosystem.

Q **You're currently developing next-generation drugs to modulate the immune system for diseases like cancer and autoimmune disorders. Could you tell us more about your research and its potential impact on global health, particularly in Africa?**

A Yeah. Every disease has an immunological basis. And with all the changes in population ageing and our lifestyle, diseases like cancer, chronic inflammation, and autoimmune disorders are becoming more common throughout the world and are increasing very rapidly in Africa. These diseases have particularly massive immune dysregulation. The current standard treatments for autoimmunity often shut down our body's natural defence (the immune system), leading to loss of protection against infections. On the other hand, cancer treatments that stimulate our immune system can over-activate immune responses. It is very hard to establish a proper balance when engaging our natural defence system to treat diseases. There is a lack of understanding of immune cell communication and of how we can leverage this immune network to design new therapeutics. The goal of my research is to discover a new class of molecules that can fine-tune immune cell communication through a network of specialised proteins called "cytokines." Rather than completely turning immune responses on or off, we hope to learn how to control this network of essential immune communication in diseases. The success of this work could advance our understanding of immune cell language and lead to the development of next-generation immunomodulating drugs that may benefit patients globally, including people in Africa.

Q **How has being an African researcher shaped your approach to science and innovation?**

A Research implies solving problems. I would mention that being African gives me a broad and unique perspective, given the challenges I have firsthand experience with back home and in the U.S. This helps me better understand unmet needs in biomedical sciences and appreciate the importance of developing accessible treatments.

Also, my exposure to traditional medicine in Congo taught me a lot about getting inspiration from nature. Many answers to research questions are found in nature. My work in the lab mostly involves creating new molecules, either as chemical tools to study a basic research question or to develop a novel strategy to treat diseases. So, I always think of a chemical compound that looks like something we find in nature. In fact, approximately half of all FDA-approved small-molecule drugs are natural products or derived directly from natural molecules with some modifications. I have developed insights to mimic what nature provides when I started as research in Congo. I think such an approach is crucial to contribute to science and biomedical innovation.

Q You've been very active in mentoring young African talents through STEM for Development. What motivates your involvement, and what gaps do you see in supporting African students to pursue STEM careers globally?

A Mentorship has played a huge role in who I am becoming. I believe mentoring young African talents in STEM is indispensable for the development of the continent. STEM mentorship is an important pillar, not only for building individual careers but also for shaping a generation of scientists, engineers, and innovators who can contribute globally.

STEM talent is clearly not bound by national borders. Yet, most countries in Sub-Saharan Africa are largely left behind when it comes to competing for top graduate programs. For instance, despite being home to over 1.1 billion people, only ~ 2,500 applicants are admitted to top countries like the U.S. each year to pursue an M.Sc. or Ph.D. in any field, with success rates at less than 10%. Many brilliant and innovative minds are easily lost from the global science and technology ecosystem. This can lead to a shortage of highly-skilled STEM talent in African countries, while also depriving host countries of valued contributions to innovation in STEM.

Many talented STEM African students possess solid credentials and outstanding qualifications to gain admission to top international graduate programs. However, they often lack critical professional skills necessary to competitively engage the international STEM ecosystem. That's where our mentorship programs with STEM for Development come in: to equip exceptional STEM students and graduates with the resources, tools, and guidance they need to succeed. This benefits their home countries and the world with empowered, brilliant minds capable of innovating and solving problems at the frontiers of modern science and technology.

Q Many African researchers abroad dream of contributing back home. What are your thoughts on strengthening research ecosystems in Africa to better support scientific innovation and collaboration?

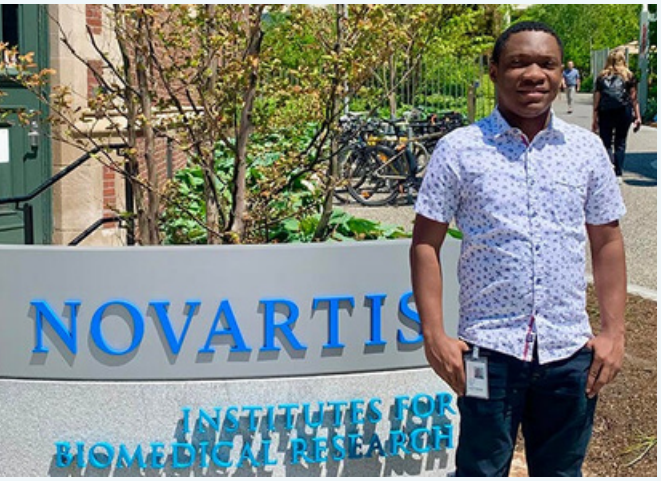
A First, I always think about mentoring young, rising African talent in STEM. It is so crucial, as I mentioned. We need more role models and established researchers who actively mentor the next generation of scientists. I would also highlight the importance of multiple collaborations, partnerships, and international talent mobility. I believe that scientific exchanges across the continent and the world would highly strengthen research ecosystems in Africa. Lastly, I would add that creating new, well-equipped research centres, facilities, and hubs where trained scientists conduct research would better support scientific biomedical innovation and collaboration in Africa.

Q Looking ahead, how do you envision your work both in research and mentorship, contributing to Africa's technological and scientific advancement?

A Through the research we are conducting, I really hope to contribute to advancing our understanding of how we could better prevent and cure diseases. Most importantly, I hope to support the development of new products and technologies, like new innovative treatments. This could help reduce the chronic disease crisis and mortality and improve healthcare in Africa and worldwide. I also hope to continue empowering young scientists to strengthen STEM talent pipelines, fostering a culture of creativity and innovation that can drive sustainable scientific impact in society.

Q Finally, what message would you share with young Africans who aspire to pursue science and make an impact globally?

A My piece of advice would be: every challenge, every detour shapes who we are becoming. Stay curious, work hard, and seek guidance - science thrives on collaboration and learning from others. Whatever happens, don't stop trying new ideas and always be optimistic. That' how science often works! Trust your instincts and follow your passion.



Modulating Immunity Chemically

ATPS Celebrates New Partnership with Carnegie Corporation to Launch ARISE Project and Strengthen Gender-Inclusive AI Leadership Across African Universities

The Carnegie Corporation of New York has awarded the African Technology Policy Studies Network (ATPS) a USD 900,000 grant to lead a new initiative titled Advancing Responsible and Gender-Inclusive Artificial Intelligence Capacity in Africa's Higher Education Ecosystem (ARISE). The three-year project, running from 2025 to 2028, will operate across 49 countries in Sub-Saharan Africa under the leadership of ATPS Executive Director Prof. Nicholas Ozor.

ARISE aims to strengthen Africa's higher education systems by developing responsible, gender-inclusive AI research, education, and policy capacity. Key activities include mapping AI resources in universities, supporting 16 doctoral and postdoctoral fellowships, facilitating curriculum development tailored to African contexts, and fostering policy dialogue at national and continental levels. The project builds on ATPS's earlier work in AI for agriculture and responds directly to the African Union's 2024 Continental AI Strategy.

By investing in advanced AI training and institutional capacity, ARISE seeks to position African universities as drivers of ethical, locally rooted technological innovation—ensuring the continent plays a central role in shaping the future of AI rather than merely adopting external models. For more information, contact ATPS at executivedirector@atpsnet.org or nozor@atpsnet.org.

ATPS Launches Community-Centred Climate Resilience Training in Podor, Senegal

From October 22 to 23, 2025, the African Technology Policy Studies Network (ATPS), in partnership with the Initiative Prospective Agricole et Rurale (IPAR), officially launched the capacity-strengthening training component of the IDRC-funded STEP Change SCALE Project in Podor, Senegal. The event marked a successful start to a hands-on initiative designed to equip farmers, extension agents, and researchers with integrated tools to enhance climate resilience in the Senegal River Valley.

The training centered on a locally led adaptation approach, empowering communities to design and implement their own climate solutions rather than relying on external prescriptions. Participants engaged with a practical resilience toolkit combining climate-smart agriculture, digital weather forecasting, and ICT-based systems for early detection of crop and livestock diseases. Gender equity was embedded in the program's design, with women making up 60% of attendees, affirming their critical role in leading sustainable adaptation. The collaborative format—bringing together farmers, technical facilitators, and researchers—fostered a dynamic local ecosystem for knowledge exchange and scalable innovation.

The launch achieved strong participant engagement, laying a solid foundation for the project's broader objectives. It also reinforced ATPS's strategic partnership with IPAR and its funders, the International Development Research Centre (IDRC/CRDI), while deepening ties with local leaders and stakeholders in Podor. More broadly, the event highlighted ATPS's distinctive ability to connect technology, policy, and grassroots action in an inclusive, context-sensitive, and results-oriented way. The Podor model offers a replicable framework for community-driven climate resilience, aligning directly with ATPS's mission. Insights and momentum from this launch will inform the project's subsequent phases and support the development of long-term, inclusive collaborations across the region.

ATPS Shapes Global Dialogue on University-Led Innovation at ACU Congress 2025

The African Technology Policy Studies Network (ATPS) played a prominent role at the **Association of Commonwealth Universities (ACU)** Congress 2025, held in Nairobi, Kenya, from 26–28 November 2025, contributing to high-level conversations on how universities can remain relevant and impactful in a rapidly changing world. Represented by its Executive Director, Prof. Nicholas Ozor, ATPS helped shape global thinking on repositioning higher education institutions as drivers of inclusive, sustainable, and human-centred innovation.

Speaking during a dedicated breakout session titled *"Innovation, Research and Development: Driving University Impact in a Changing World,"* Prof. Ozor challenged universities to move beyond linear models of knowledge transfer and embrace multi-actor collaboration and value co-creation. He emphasised the need for universities to function as conveners of diverse ecosystems—bringing together industry, government, civil society, local communities, and non-profits in bi-directional knowledge exchange processes that respond to real-world challenges.

Prof. Ozor further underscored the importance of human-centred innovation, arguing that university-led research and innovation must prioritise social and environmental well-being alongside economic growth.

He highlighted areas such as climate change mitigation, public health, clean energy, and social inequality as domains where universities can anchor transformative solutions. To achieve this, he called for embedding entrepreneurial mindsets with social purpose, promoting social innovation and social entrepreneurship models that enable students and researchers to create sustainable solutions to societal problems.

A key pillar of his presentation was the need for interdisciplinary and problem-based learning. Prof. Ozor advocated for curricula that break down academic silos and equip students with practical skills through real-world, project-based learning. Such approaches, he noted, better prepare graduates to navigate complex, interconnected global challenges. He also highlighted the role of universities as anchors and trust-builders within local ecosystems, leveraging their neutrality and credibility to facilitate cooperation, build consensus, and develop solutions tailored to regional contexts.

In addition, Prof. Ozor proposed reimagining university campuses as "living laboratories"—spaces where sustainable practices such as renewable energy deployment, waste management, and green infrastructure are implemented and used as learning, research, and innovation testbeds. These initiatives, he argued, allow universities to model the transitions they advocate for in society.

Beyond articulating what universities should do, Prof. Ozor outlined the preconditions necessary for institutions to perform this expanded role effectively. These include supportive governance and leadership with a clear strategic vision; adaptable internal policies that enable cross-disciplinary collaboration; adequate and diversified funding for research, innovation, and community engagement; clear intellectual property frameworks to support equitable commercialization; and robust physical and digital infrastructure such as incubators, co-creation spaces, and advanced digital platforms. He also stressed the importance of aligning incentives across academia, industry, government, and communities, and investing heavily in homegrown human capacity and technology-driven skills development aligned with industry needs.

The Congress provided a strategic platform for ATPS to reinforce its leadership in linking policy, research, and practice. By advancing a model in which universities operate as ecosystem builders—rather than isolated knowledge producers—ATPS contributed to shaping a future where higher education institutions are central to inclusive, community-centred, and sustainable development. The event concluded with strengthened networks and renewed momentum for collaborative action across the Commonwealth's higher education landscape.

Dr. Nkem Khumbah, Head of STI-PGA at the African Academy of Sciences (AAS), presents a plaque to Prof. Nicholas Ozor, Executive Director of ATPS, at ATPS Headquarters in Nairobi on Nov. 13, 2025. The meeting officially reactivated the Memorandum of Understanding between the two organizations to enhance future collaboration.

ATPS Highlights

FROM 2025

As 2025 draws to a close, we at the African Technology Policy Studies Network (ATPS) want to take a moment to express our sincere gratitude for your continued support and partnership over the past year.

We wish you and your loved ones a restful and joyous festive season. May the New Year bring peace, renewed energy, and a prosperous 2026.

Warm regards,

The ATPS Team

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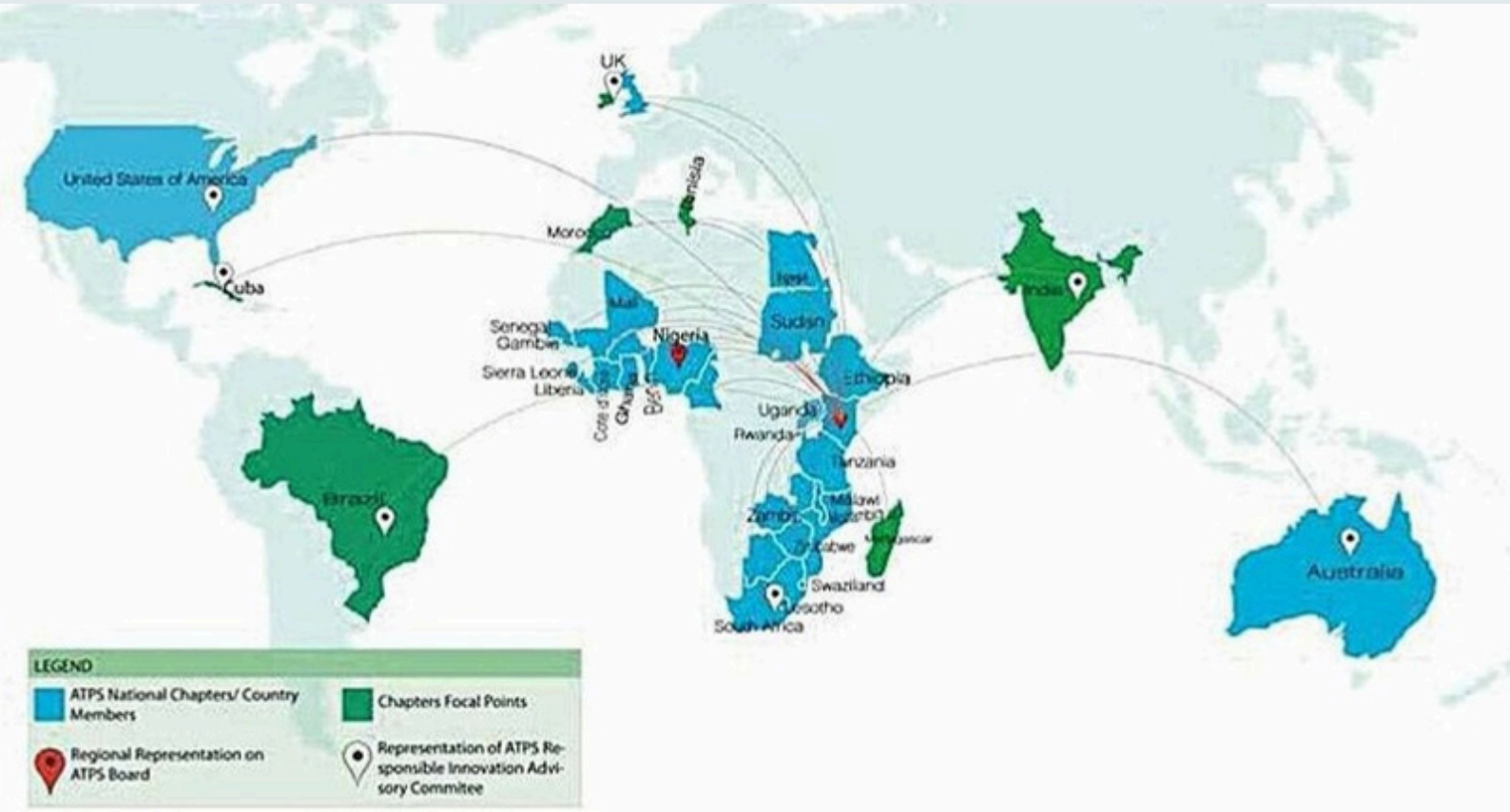

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