>>> **NEWSLETTER** <<<

TECHNOPOLICY AFRICA

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

ADVANCING SCIENCE AND TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT

COVER ARTICLES

Scaling Responsible AI: A Framework for Agriculture and Food Systems in Africa

By Engr. Professor Joel Nwakaire

Artificial Intelligence (AI) is rapidly transforming agriculture and food systems in Africa, offering innovative solutions to some of the continent's most pressing challenges. From precision farming to enhanced supply chain management, AI technologies are enhancing productivity, improving food security, and fostering sustainable ....pg 4

Modeling Drug Resistance Mechanisms and Treatments

By Babatunde Samuel Obadawo

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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:

Chairman's Message

As we approach the end of the third quarter of 2024, I am pleased to connect with you once again as the Chair of the African Technology Policy Studies (ATPS) Board of Directors. This year has been a period of remarkable progress and steadfast dedication by our team at the ATPS, guided by the exceptional leadership of our Executive Director, Prof. Nicholas Ozor.

Prof. Crispus Kiamba
Chairman, ATPS Board of Directors

From the beginning of the year, our efforts have been marked by an unwavering commitment to advancing science, technology, and innovation (STI) for the sustainable development of Africa. I want to take this moment to express my gratitude to everyone who has been part of this journey. Your engagement, whether through participation in our events, contribution to our research, or support of our initiatives, has been invaluable. Together, we have fostered an environment where ground-breaking ideas are nurtured, and evidence-based policies are developed, all with the aim of driving sustainable development in Africa. As we look ahead to the remainder of the year, our commitment to leveraging STI for positive change remains as strong as ever.

We recognize the challenges that lie ahead, but we are also confident in the power of collective action by our team and partners. By continuing to work together, we can shape policies and implement solutions that will lead to a more sustainable, inclusive, and technologically advanced future for all.

In this spirit of collaboration, I encourage each of you to stay engaged, continue contributing your expertise, and support the ongoing efforts to advance STI in Africa. The work we do together is vital, and its impact is far-reaching.

Thank you for being a part of this journey. As we move forward, let us remain focused on our shared goals, confident in our ability to make a lasting difference across the continent.

Executive Director's Message

I feel honoured reflecting on the remarkable progress that the African Technology Policy Studies Network (ATPS) has made so far in the third quarter of 2024. Our journey has been one of innovation, collaboration, and an unwavering commitment to advancing science, technology, and innovation (STI) across the continent.

A significant milestone for ATPS this year is securing a new grant aimed at "Advancing Responsible Gender Equality and Inclusive

Prof. Nicholas Ozor
Executive Director, ATPS

Inclusive Artificial Intelligence Innovations for Agriculture and Food Systems in Africa (AI4AFS +)" This initiative, generously funded by the International Development Research Centre (IDRC) and the Swedish International Development Cooperation Agency (SIDA), builds on the success of the original 10 AI4AFS projects implemented across Africa. The new project will see the innovative AI and machine learning tools developed by our grantees in Cape Verde, Ghana, Kenya, Malawi, Nigeria, Senegal, Tanzania, and Uganda scaled and used to further enhance agricultural productivity, sustainability, and resilience. The continued support from IDRC and SIDA is a testament to the impact of our work and the trust these esteemed donor organizations have in ATPS.

Another highlight of this year is seeing the ATPS being shortlisted by the Global Center on Adaptation (GCA) to participate in their framework agreement (mini-competition) to provide technical services to support climate adaptation in the food security sector of Africa and South Asia. The GCA is a leading international organization dedicated to accelerating adaptation action in response to climate change. Being considered for this opportunity underscores ATPS's growing influence in the global STI landscape. Success in this mini-competition would enable us to collaborate on and implement critical projects aimed at building climate resilience across Africa, further reinforcing our leadership in driving adaptive and innovative solutions to the catastrophic impacts of climate change in Africa.

I must take this opportunity to express my deepest gratitude to the entire ATPS team. Your dedication, hard work, and commitment to excellence have been instrumental in driving our mission forward. I am also profoundly thankful to all our stakeholders – donors, partners, collaborators, and supporters - whose unwavering support has been vital to our achievements.

As we continue to build on this momentum, I invite donors, partners, and other stakeholders who share our vision and support the implementation of the new ATPS Phase IX Strategic Plan 2023-2028. Key thematic priority areas of the Strategy focus on seven areas including:

1) agriculture, food and nutrition security;

2) energy;

3) climate change and environment;

4) health innovations;

5) education and technology;

6) creative industries and entrepreneurship; and

7) digital economy and ICT.

Similarly, the Programmatic priority areas of the ATPS Strategy cover

a) STI policy research, policymaking, and advocacy;

b) training, sensitization and capacity building;

c) youth and gender empowerment;

d) knowledge brokerage, management, and commercialization; and

e) intra-Africa and global collaboration and partnerships.

Together, we can expand our impact, drive transformative change, and create a more sustainable and technologically advanced Africa. Your involvement is crucial in helping us realize the full potential of STI to address the continent's most pressing challenges.

Thank you for your continued support, and I look forward to the opportunities that lie ahead. Let us move forward with renewed energy and a shared commitment to making a lasting difference across Africa.

Developing, Deploying, and Scaling Responsible AI: An Assessment Framework for Agriculture and Food Systems in Africa

By Engr. Professor Joel Nwakaire a postdoctoral research fellow 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. Joel Nwakaire is a Professor in the Agricultural and Bio-resources Engineering Department, University of Nigeria, Nsukka. He has worked for 16 years as a lecturer in the Agricultural and Bioresources Engineering Department, University of Nigeria, Nsukka. He obtained his PhD in 2013, and the product of his thesis was nominated as among the fifth most innovative work in Africa during the maiden edition of the Innovation Prize for Africa.

Engr. Professor Joel Nwakaire

Artificial Intelligence (AI) is rapidly transforming agriculture and food systems in Africa, offering innovative solutions to some of the continent's most pressing challenges. From precision farming to enhanced supply chain management, AI technologies are enhancing productivity, improving food security, and fostering sustainable agricultural practices. Artificial Intelligence can be used for soil monitoring, robo-cropping, weed management, crop diseases management, pest management and irrigation. It can be used to monitor the growth and productivity of livestock. However, as AI integration accelerates, concerns about potential biases and inequalities are rising. These fears are particularly acute when it comes to the impact on women and marginalized communities who already face significant barriers in accessing resources and opportunities within the agricultural sector.

The introduction of AI in agriculture has the potential to either bridge or widen the existing gaps. Without careful consideration, AI systems could inadvertently reinforce existing biases, exacerbating inequalities rather than alleviating them. For instance, AI algorithms trained on skewed data could marginalize smallholder farmers, particularly women, by failing to consider their unique challenges and needs. This highlights the urgent need for a framework that ensures the development and deployment of responsible and inclusive AI systems tailored to Africa's agricultural context. Such a framework should prioritize fairness, transparency, and accountability. It should also involve stakeholders from diverse backgrounds, including women, smallholder farmers, and marginalized groups, in the design and implementation process. By doing so, AI can be leveraged to not only enhance agricultural productivity but also to promote equity and inclusivity, ensuring that the benefits of these technologies are shared broadly across society. The integration of Artificial Intelligence (AI) in agriculture and food systems presents transformative opportunities for enhancing productivity, sustainability, and resilience.

However, to ensure these technologies benefit all stakeholders equitably, a structured framework for developing, deploying, and scaling responsible AI is crucial. Recent studies have emphasized the importance of responsible AI in various sectors, including agriculture, highlighting the need for careful consideration of ethical, social, and environmental impact.

This article outlines a guiding framework tailored to the unique needs of African agriculture and food systems, covering three major stages: Pre-AI Development and Research, the Development and Research Process, and Deployment and Testing. The framework was developed as part of the lessons learned from the implementation of the Artificial Intelligence for Agriculture and Food Systems (AI4AFS) project funded by the International Development Research Centre (IDRC), Canada and The Swedish International Development Agency (Sida). This framework aims to ensure that AI technologies are developed responsibly and deployed effectively, ultimately benefiting all stakeholders. Figure 1 shows the AI4AFS guidance framework for responsible AI development, deployment and scaling in Africa's Agriculture and Food Systems.
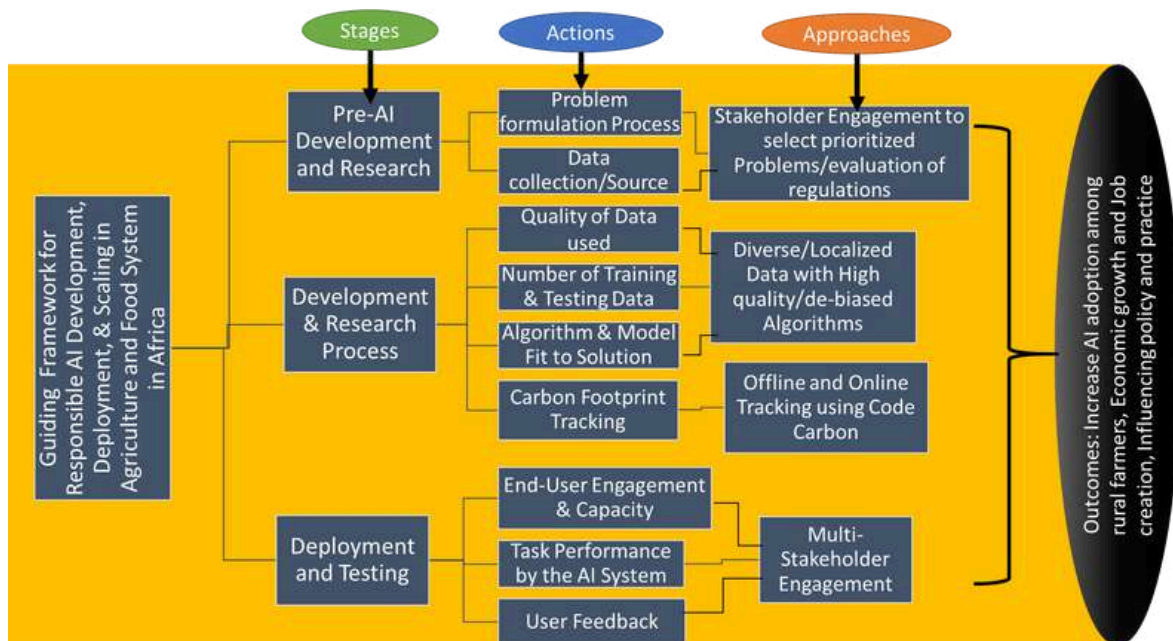

Figure 1: A guiding framework for responsible AI development deployment and scaling in agriculture and food systems in Africa

Understanding the Framework

The guiding frame work has three stages of Artificial Intelligence development deployment and scaling. Each of the stages are described below.

Stage 1. Pre-AI Development and Research

This stage is crucial for establishing a responsible and effective AI implementation strategy. It involves laying the groundwork by thoroughly understanding the problem within its specific context, particularly in agriculture and food systems. During this phase, the focus is on defining the problem with precision, ensuring it aligns with the unique challenges and opportunities present in the local environment. Additionally, gathering the necessary data and resources is essential to support the AI development process.

By meticulously preparing at this stage, the likelihood of developing an AI solution that is both relevant and impactful increases significantly.

Problem Formulation Process

The problem formulation process is a critical first step in responsible AI development. It begins with a clear definition of the agricultural or food system challenge to be addressed, taking into account the local context, economic conditions, and environmental factors. Early engagement with a broad range of stakeholders, including farmers, agronomists, and policy makers, is essential to ensure that the problem is well-understood and that the AI solution is relevant to the community it is intended to serve. This collaborative approach not only clarifies the problem but also helps in identifying any potential barriers to adoption, thereby guiding the development of a more tailored and effective AI intervention.

Data Collection/Source

Data collection is a foundational element of AI development, particularly in agriculture, where variability across regions can significantly impact outcomes. Identifying and gathering data from reliable and diverse sources ensures that the AI model can accurately reflect the varied conditions found in different agricultural settings. This includes considering data from different climates, soil types, crop varieties, and farming practices. It is also crucial to address potential biases during data collection, such as underrepresentation of certain regions or farming communities, which could lead to biased AI solutions that perpetuate existing inequalities. By ensuring that the data is comprehensive and unbiased, developers can create AI models that are both fair and effective across different agricultural contexts.

Stage 2. Development and Research Process

This stage is critical for the responsible development of AI systems, where the emphasis shifts towards refining AI models, ensuring their quality, and incorporating user feedback to create a robust and reliable product. The process involves iterative cycles of development, testing, and validation to fine-tune AI algorithms. Collaboration between data scientists, domain experts, and end-users is essential to ensure that the AI system meets real-world needs and performs effectively in its intended context. By focusing on these aspects, developers can enhance the performance, reliability, and trustworthiness of AI systems, paving the way for responsible deployment in various sectors.
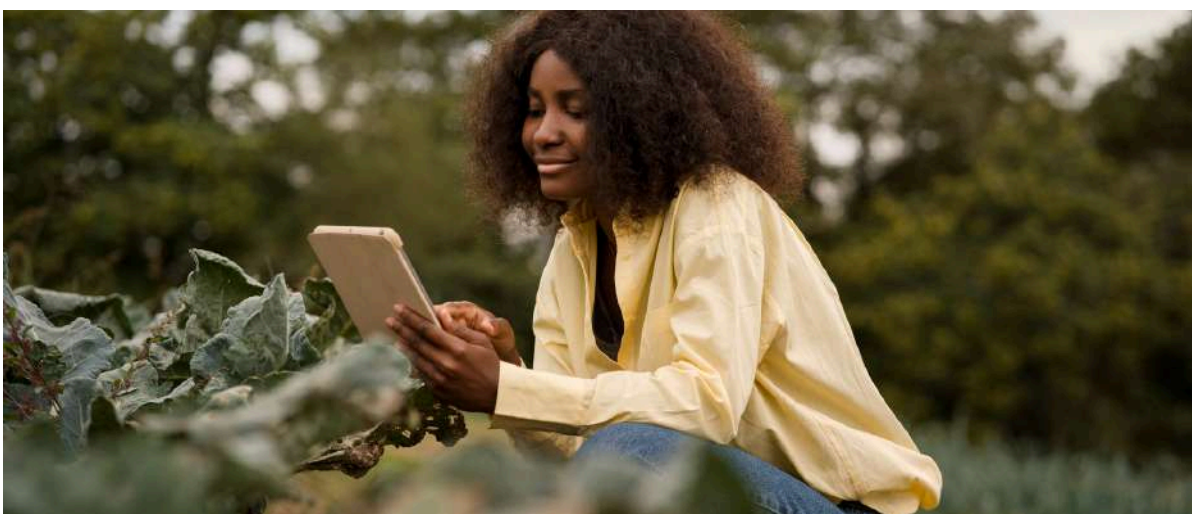
Quality of Data Used

The quality of data used in training and testing AI models is a cornerstone of AI reliability and effectiveness. Continuous monitoring and improvement of this data are crucial to maintaining high standards. This involves employing advanced techniques for data cleaning and preprocessing to ensure that the information is accurate, complete, and representative of the domain it is meant to serve. Additionally, data should be free from biases that could skew AI predictions, which requires a concerted effort to identify and mitigate any sources of bias. To maintain data quality, it's essential to establish protocols for regular data audits and updates, especially as new data becomes available. By maintaining a high standard of data quality, AI systems are better equipped to make accurate predictions and decisions that are fair and unbiased, thus supporting responsible AI development.

Number of Training & Testing Data

To develop AI models that are both robust and generalizable, it is imperative to use a sufficiently large volume of training and testing data. This data must be comprehensive and representative, capturing the wide variability in agricultural practices, environmental conditions, and geographic locations. By incorporating diverse datasets, the AI model can learn to recognize and adapt to different scenarios, improving its accuracy and effectiveness in real-world applications. Additionally, diverse data helps in mitigating biases, ensuring that the AI system performs equitably across various contexts. The inclusion of data from different regions and practices also allows the model to generalize better, reducing the risk of overfitting to specific conditions. Ultimately, the goal is to create an AI system that is not only technically proficient but also fair, reliable, and widely applicable.

Algorithm & Model Fit to Solution

Choosing or developing the right algorithm is pivotal to the success of AI in agriculture. The selected algorithm must be capable of handling the specific types of data and variability that are typical in agricultural settings, such as fluctuating weather patterns, soil fertility, and crop disease outbreaks. It is important to validate the algorithm against local conditions to ensure that it is not only technically sound but also relevant to the specific challenges faced by farmers in the region. Furthermore, adapting the model to suit local contexts can significantly enhance its effectiveness and usability, ensuring that the AI solution is both practical and beneficial for its intended users.

Carbon Footprint Tracking

In the context of responsible AI development, tracking and managing the carbon footprint of AI development and deployment processes is increasingly important. The energy consumption associated with training large AI models can be significant, and it is vital to implement strategies that minimize environmental impact. This includes optimizing algorithms to reduce computational requirements, utilizing energy-efficient hardware, and exploring renewable energy sources for data centers. Developers should also consider the entire lifecycle of AI systems, from development through deployment, and seek opportunities to reduce emissions at each stage.

Furthermore, transparency in reporting the environmental impact of AI projects can foster accountability and encourage the adoption of best practices across the industry. By integrating carbon footprint tracking into the AI development process, organizations can align their AI initiatives with broader sustainability goals, contributing to the global effort to combat climate change.

Stage 3. Deployment and Testing

This stage is crucial as it focuses on bringing AI tools from development to real-world application. The deployment process involves integrating AI systems into their intended environments, ensuring they function as expected under diverse conditions. Rigorous testing is conducted to evaluate the AI's performance, reliability, and ethical considerations. Continuous monitoring and refinement are essential, as user feedback and real-world data help identify areas for improvement. This stage ensures the AI tools are not only effective but also align with ethical standards and user expectations.

Task Performance by the AI System

Ensuring the effective task performance of AI systems requires a comprehensive approach that includes rigorous testing and validation. The number of training and testing datasets used plays a pivotal role in this process. It is essential to have a sufficient volume of diverse data to train AI models robustly, allowing them to generalize across various scenarios and reduce the risk of overfitting.

Diverse datasets should capture the full spectrum of variability in the domain, such as different agricultural practices and environmental conditions, to ensure that AI models can adapt to real-world complexities. Additionally, performance metrics should be continuously monitored to evaluate how well the AI system performs its designated tasks. Feedback loops, where user interactions are analyzed and incorporated into model updates, are crucial for maintaining high task performance and addressing any emerging issues, thus ensuring the system remains reliable and effective over time.

End-User Engagement & Capacity

Involving end-users, such as farmers and agricultural workers, from the beginning of the AI development process is crucial for ensuring that the technology meets their needs and is usable in real-world conditions. This involves not only understanding their needs and constraints but also providing training and support to build their capacity to effectively use AI tools. Regular feedback from end-users can guide the refinement of the AI solution, making it more intuitive and easier to integrate into existing practices. By empowering users through education and ongoing support, developers can ensure that the AI solution is not only adopted but also used to its full potential, leading to better outcomes in agricultural productivity and sustainability.

User Feedback

User feedback is a vital component in the deployment and testing of AI systems. It serves as a direct source of information about the AI's performance in real-world scenarios. Gathering feedback from a diverse user base allows developers to understand how the AI interacts with different populations and in various contexts. This input is essential for identifying biases, errors, and areas that require further refinement. By actively incorporating user feedback, developers can enhance the AI's functionality, ensuring it meets user needs while adhering to ethical guidelines. Continuous engagement with users also fosters trust and transparency, which are crucial for the responsible deployment of AI technologies.

Key Approaches for responsible AI development and deployment

The approach learned in the project implementation includes

1 The Triple-Helix Process to Technology Development

The triple-helix process involves a dynamic collaboration between government, research institutions, civil societies, and private sector actors, fostering innovation and responsible AI development. In this approach, governments provide regulatory support and policy frameworks, research institutions contribute scientific expertise and technological advancements, civil societies advocate for public interests and ethical considerations, and private sector actors bring in resources, market knowledge, and scalability potential. This synergy ensures that AI technologies are developed with a holistic perspective, addressing societal needs while driving economic growth. The triple-helix model is particularly effective in aligning AI solutions with the unique challenges and opportunities in Africa's agricultural sector.

2 Strong Stakeholder Engagement in Problem Identification and Prioritization

Effective stakeholder engagement is crucial for identifying and prioritizing the most pressing issues in the agricultural sector that AI can address. This approach involves early and continuous involvement of key stakeholders, including farmers, policymakers, agronomists, and community leaders, to ensure that AI solutions are relevant, practical, and widely accepted. By incorporating diverse perspectives, this process helps to surface challenges that may be overlooked and ensures that the AI tools developed are tailored to meet the real needs of the communities they are designed to serve. Strong stakeholder engagement fosters trust, enhances the relevance of AI interventions, and promotes equitable outcomes.

3 Robust Monitoring and Evaluation

Robust monitoring and evaluation mechanisms are essential to ensure that AI tools are transparent, explainable, and effective in fulfilling their intended tasks. This approach involves continuous assessment of AI systems throughout their lifecycle, from development to deployment, to ensure they operate as expected and deliver on their objectives. It includes the use of performance metrics, user feedback, and regular audits to detect and mitigate biases, errors, and unintended consequences. Transparent reporting of these evaluations is critical to building trust among stakeholders and ensuring accountability. By maintaining rigorous monitoring and evaluation, AI tools can be refined and optimized, ensuring they contribute positively to agricultural productivity and sustainability in Africa.

Conclusion

The integration of Artificial Intelligence (AI) into Africa's agriculture and food systems offers significant opportunities for improving productivity, sustainability, and food security. However, without careful planning, AI could exacerbate existing inequalities, particularly among women and marginalized communities. A structured and responsible framework is crucial to ensure that AI technologies are developed and deployed in ways that are equitable, transparent, and inclusive. This framework must prioritize local context, stakeholder engagement, and continuous refinement based on user feedback, aiming to create AI solutions that are not only technically effective but also socially responsible.

Integrated Computational Modeling of Drug Resistance Mechanisms and Treatment Strategies in Mycobacterium tuberculosis and Pseudomonas aeruginosa

Babatunde Samuel Obadawo, a US-based Nigerian chemist pioneering advancements in the field of computational and medicinal chemistry. He is dedicated to contributing to drug discovery efforts and mentoring the next generation of scientists. Currently, Babatunde is a research assistant at the University of Toledo, leading innovative projects in drug candidate synthesis and characterization. His work is well-documented through numerous scientific publications and conference presentations, underscoring his commitment to advancing the field of chemistry

Babatunde Samuel Obadawo

Drug-resistant infections caused by Mycobacterium tuberculosis (Mtb) and Pseudomonas aeruginosa represent a critical public health challenge, resulting in prolonged illness and higher mortality rates. Drug resistance in Mtb and P. aeruginosa significantly hampers treatment efficacy, leading to increased healthcare costs and patient morbidity. The traditional methods of combating resistance through the development of new antibiotics are time-consuming and often met with rapid emergence of resistance. Moreover, the complex interactions between bacterial pathogens and their hosts are not fully understood, making it challenging to develop effective treatment regimens. Therefore, there is an urgent need for innovative approaches that can integrate various biological data and provide actionable insights into combating drug resistance.

Integrated Computational Modeling Framework; A proposed solution

This proposed solution involves developing an integrated computational modeling framework to understand and combat drug resistance in Mtb and Pseudomonas aeruginosa. This framework combines multiple data sources and analytical techniques, leveraging machine learning (ML) and artificial intelligence (AI) to predict resistance patterns, identify novel therapeutic targets, and optimize treatment strategies.

1. Understanding Genetic Basis of Resistance

Approach:

▷ Data Collection: Gather extensive genomic data from clinical isolates of Mtb and Pseudomonas, including both resistant and susceptible strains.

▷ Feature Extraction: Use bioinformatics tools to extract relevant features from the genomic data, such as single nucleotide polymorphisms (SNPs), gene expression levels, and structural variations.

▷ Model Training: Train ML models, such as random forests, support vector machines (SVMs), and neural networks, on this data to learn patterns associated with resistance.

▷ Validation: Validate the models using independent datasets to ensure accuracy and generalizability.

Outcome: The trained models can quickly identify resistance mutations in new bacterial isolates, facilitating rapid diagnosis and treatment adjustments.

2. Identifying Novel Therapeutic Targets

Approach:

▶ Network Analysis: Construct and analyze biological networks, such as protein-protein interaction networks and gene regulatory networks, using graph-based ML algorithms.

▶ Target Prioritization: Apply algorithms like PageRank or clustering techniques to identify critical nodes (potential drug targets) in these networks.

▶ Validation: Experimentally validate the predicted targets using laboratory techniques like CRISPR-Cas9 gene editing or RNA interference (RNAi).

Outcome: This process can reveal new drug targets that are essential for bacterial survival or virulence, providing new avenues for therapeutic intervention.

3. Virtual Screening of Drug Compounds

Approach:

▶ Compound Library: Compile a large library of chemical compounds from public databases and proprietary sources.

▶ Docking Simulations: Use molecular docking algorithms to simulate the binding of these compounds to the identified targets.

▶ Scoring and Ranking: Apply ML models to score and rank the compounds based on their predicted binding affinity and biological activity.

▶ Lead Optimization: Use generative models, such as variational autoencoders (VAEs) and generative adversarial networks (GANs), to optimize the lead compounds for better efficacy and reduced toxicity.

Outcome: Virtual screening accelerates the drug discovery process by identifying promising candidates for further experimental testing, reducing the time and cost involved in bringing new drugs to market.

Conclusion

Machine learning and AI offer transformative potential in addressing the challenge of drug resistance in Mycobacterium tuberculosis and Pseudomonas aeruginosa. By predicting resistance patterns, identifying novel therapeutic targets, optimizing drug discovery, and personalizing treatment strategies, these technologies can significantly enhance our ability to combat these pathogens. Implementing integrated computational modeling frameworks that leverage AI and ML will not only improve patient outcomes but also pave the way for innovative and efficient approaches to managing drug-resistant infections.

Taxation In The Gig Economy: Implications For Africa, With A Focus On Nigeria
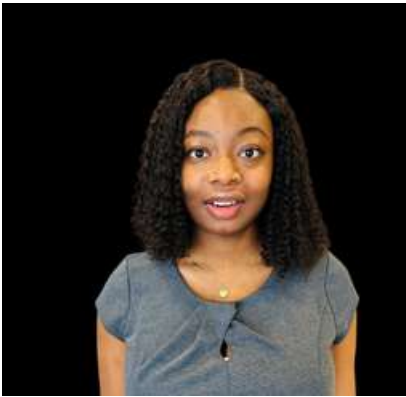
Dr. Beatrice Oyinkansola Adelakun

By Dr. Beatrice Oyinkansola Adelakun, an Audit and Assurance Analyst at Deloitte, USA. Beatrice Oyinkansola Adelakun stands out as a leading expert working to ensure the sector's sustainable growth. Through her extensive research on the taxation of gig workers, Adelakun is not only contributing to the academic discourse but also influencing policy changes that will shape the future of this burgeoning industry.

The term "gig economy" refers to the economic framework in which a workforce of individuals, referred to as "gig workers," partake in side jobs and/or freelance work. Workers, consumers, and business entities make up the gig economy. The gig economy is defined by the Internal Revenue Service as "activity where people earn income providing on-demand work, services, or goods." It is noted that earnings may take the form of "cash, property, goods, or virtual currency" and that the activity is frequently facilitated through a digital platform like a website or mobile app. The Fair Work Ombudsman claims that for a price, the digital platforms or marketplaces link certain service providers with clients directly. The term "a labor market characterised by the prevalence of short-term contracts" was defined by the BBC. The gig economy, characterized by flexible, short-term, and freelance work arrangements, has grown significantly across the globe, including in Africa. In Nigeria, platforms such as Uber, Bolt, Upwork, and Fiverr have facilitated the rise of this new economic sector, offering numerous opportunities for income generation. However, the rapid expansion of the gig economy poses unique challenges for taxation policies, necessitating a re-evaluation of existing frameworks to ensure fair and efficient tax collection.

The Rise of the Gig Economy in Nigeria

Nigeria's gig economy has flourished due to several factors, including high unemployment rates, technological advancements, and the proliferation of internet access. For many Nigerians, gig work offers a viable alternative to traditional employment, providing flexibility and the potential for higher earnings. The National Bureau of Statistics reports that the informal sector, which includes gig work, accounts for about 65% of Nigeria's total GDP, highlighting the importance of this sector in national economic planning. A survey conducted by Jobberman in 2021 estimated that approximately 1.3 million Nigerians are engaged in gig work, a number that is expected to grow rapidly.

Challenges in Taxation

The traditional tax systems in Nigeria and many other African countries are designed around conventional employment and business models. These systems often fail to capture the dynamic and fragmented nature of the gig economy. Many gig workers operate informally and are not registered with tax authorities, making it difficult to track and tax their income.

Gig workers often have irregular and fluctuating incomes, complicating the assessment and collection of taxes. Many gig economy transactions occur on digital platforms that may not be based in Nigeria, posing challenges for tax jurisdiction and enforcement. There is often a lack of awareness among gig workers about their tax obligations, leading to low compliance rates.

Taxation Policies in Nigeria

The Nigerian government has recognized the need to adapt its tax policies to the evolving economic landscape. The Federal Inland Revenue Service (FIRS) has initiated efforts to bring the gig economy within the tax net. Nigeria has implemented a digital services tax aimed at foreign digital platforms operating in the country. This policy is a step towards ensuring that these platforms contribute to the local tax base. To encourage compliance, the government is exploring simplified tax regimes for small businesses and informal workers, which could include gig workers. Efforts are underway to educate gig workers about their tax responsibilities and the benefits of compliance.
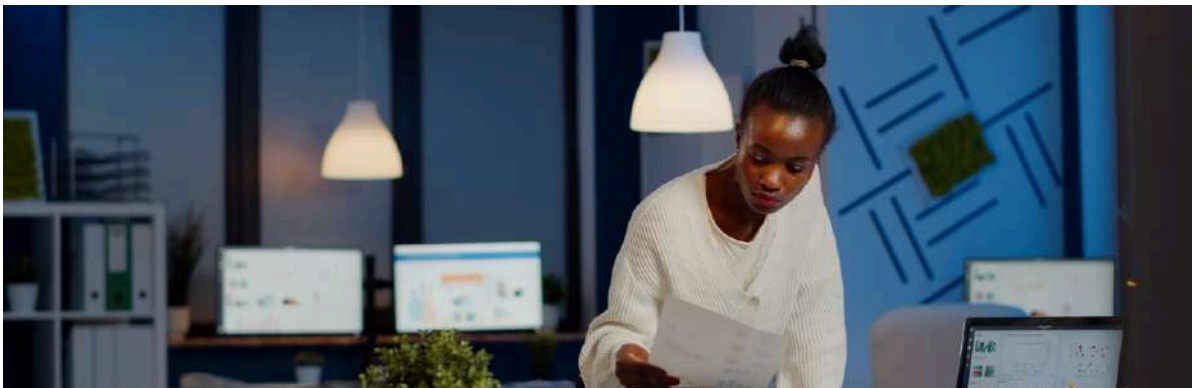
Lessons from Other Countries

Nigeria can draw lessons from other countries that have made strides in taxing the gig economy. The UK has introduced the "Making Tax Digital" initiative, which requires digital record-keeping and periodic tax submissions, simplifying the process for gig workers. The US requires gig platforms to report earnings of their users to the Internal Revenue Service (IRS), improving income visibility and tax compliance. India has implemented a Goods and Services Tax (GST) on digital services, ensuring that gig platforms contribute to the national tax base.

Policy Recommendations

To effectively tax the gig economy in Nigeria, the following policy recommendations should be considered. Collaborate with digital platforms to ensure they report the earnings of Nigerian gig workers to the tax authorities. This could involve mandatory reporting requirements for platforms operating in Nigeria. Develop simplified tax regimes tailored to the unique characteristics of gig work, such as presumptive taxes or flat-rate taxes based on estimated income brackets. Invest in digital tax administration systems that can handle the complexity and scale of the gig economy, ensuring efficient and accurate tax collection. Launch comprehensive public awareness campaigns to educate gig workers about their tax obligations and the benefits of compliance, leveraging digital media and platforms popular among gig workers. Offer incentives such as tax credits or deductions for gig workers who register and comply with tax regulations, encouraging voluntary compliance.

Conclusion

The gig economy presents both opportunities and challenges for Nigeria and other African countries. By adapting taxation policies to the realities of the gig economy, Nigeria can ensure fair tax contributions from all economic participants while fostering the growth and sustainability of this vibrant sector. Thoughtful policy design and effective implementation will be crucial in harnessing the full potential of the gig economy for national development.

As Nigeria continues to navigate the complexities of taxing the gig economy, it stands to benefit from the experiences of other countries and the innovative solutions they have employed. With the right approach, Nigeria can create a tax environment that supports economic growth, enhances revenue collection, and ensures equity in the tax system. The impact of these measures could be significant. For instance, a World Bank report suggests that improved tax compliance in the informal sector, including the gig economy, could increase Nigeria's tax revenue by up to 3% of GDP. This additional revenue could be pivotal in addressing critical areas such as infrastructure development, healthcare, and education, thereby promoting overall national growth and development. By addressing the taxation challenges of the gig economy, Nigeria can not only boost its revenue but also create a more inclusive and equitable economic environment. This, in turn, will support the broader goals of sustainable development and economic resilience in the face of global economic shifts.

Harnessing the Power of the Sun: A Case Study on Renewable Energy in Kenya

Mwangi Kimani

By Mwangi Kimani, a seasoned environmental journalist and renewable energy advocate with over a decade of experience reporting on climate change and sustainable development in Africa. Holding a degree in Environmental Science from the University of Nairobi, Mwangi has dedicated his career to highlighting the intersection of technology, policy, and environmental stewardship.

As the global community intensifies its efforts to combat climate change, renewable energy has emerged as a critical component in the quest for a sustainable future. In Africa, where many regions are blessed with abundant natural resources, the shift towards renewable energy is not just a necessity but an opportunity to drive economic growth, improve energy access, and enhance environmental sustainability. This article delves into Kenya's strides in harnessing solar energy, showcasing how the country's initiatives are lighting the way for the rest of the continent.

The Kenyan Context: A Nation Embracing the Sun

Kenya, located on the equator, enjoys a geographical advantage with high solar insolation throughout the year. This makes it an ideal candidate for solar energy production. Over the past decade, Kenya has made significant progress in diversifying its energy sources, with a strong focus on renewable energy. Currently, over 80% of Kenya's electricity is generated from renewable sources, including hydro, geothermal, wind, and solar power.

One of the standout successes in Kenya's renewable energy sector is the development of solar mini-grids in rural areas. These projects have not only provided electricity to communities that were previously off the grid but have also catalysed local economic development.

Case Study: The Solar Mini-Grid in Kalobeyei, Turkana County

Kalobeyei, a settlement in Turkana County, is home to a large population of refugees and host communities. This area, like many others in northern Kenya, has historically struggled with access to reliable electricity. In response to these challenges, the Kenya Ministry of Energy, in collaboration with international partners and private sector players, implemented a solar mini-grid project in Kalobeyei.

Project Implementation and Impact

The Kalobeyei solar mini-grid project was designed to provide clean, reliable, and affordable electricity to both the refugee and host communities. The project was funded by a consortium of donors, including the United Nations High Commissioner for Refugees (UNHCR) and the European Union, with technical support from Kenyan energy experts.

The mini-grid comprises solar photovoltaic (PV) panels with a capacity of 60kWp, coupled with battery storage to ensure a steady supply of electricity even during periods of low sunlight. The system powers homes, schools, health centres, and small businesses in the settlement, significantly improving the quality of life for residents.

One of the key impacts of this project has been the stimulation of local economic activities. With access to electricity, small businesses such as barbershops, welding shops, and grocery stores have sprung up, providing much-needed employment opportunities. Additionally, schools in the area can now offer evening classes, and health centres can operate more effectively, with improved refrigeration for medicines and vaccines.

Environmental and Social Benefits

Beyond the economic impact, the Kalobeyei solar mini-grid has brought substantial environmental and social benefits. By reducing reliance on diesel generators, the project has cut down on greenhouse gas emissions, contributing to Kenya's commitments under the Paris Agreement. Moreover, the use of solar energy has eliminated the need for kerosene lamps, which are not only a health hazard but also a financial burden for low-income households.

The social impact of the project cannot be overstated. Access to electricity has empowered women and girls in Kalobeyei, enabling them to engage in income-generating activities and continue their education beyond daylight hours. This has had a ripple effect on the community, fostering greater gender equality and improving overall living standards.

Challenges and Lessons Learned

Despite its successes, the Kalobeyei solar mini-grid project has faced several challenges. One of the main obstacles has been the high initial cost of installation and the need for ongoing maintenance. While donor funding covered the initial setup, ensuring the project's sustainability requires a robust business model that can generate enough revenue to cover operational costs.

Another challenge has been the integration of the mini-grid with the national grid. As Kenya continues to expand its national grid, there is a need to ensure that mini-grid projects like the one in Kalobeyei are not rendered obsolete but are instead integrated into the broader energy infrastructure.

From this project, several lessons have emerged that can inform future renewable energy initiatives in Africa. Firstly, community involvement is crucial for the success and sustainability of such projects. The Kalobeyei project benefited from active participation by the local community, which helped to ensure that the project met their needs and was well-maintained.

Secondly, public-private partnerships are key to overcoming financial and technical challenges. The collaboration between the Kenyan government, international donors, and private sector players was instrumental in the success of the Kalobeyei project. Such partnerships can provide the necessary funding, technical expertise, and scalability to make renewable energy projects viable in other parts of Africa.

Environmental and Social Benefits

The success of the Kalobeyei solar mini-grid project offers valuable insights into how renewable energy can be harnessed to drive sustainable development in Africa. However, to achieve this on a larger scale, several factors need to be addressed.

Firstly, there is a need for increased investment in renewable energy infrastructure. Governments across Africa must prioritize renewable energy in their development agendas and create an enabling environment for private sector investment. This includes providing incentives such as tax breaks, subsidies, and favorable regulatory frameworks.

Secondly, capacity building is essential. African countries need to invest in training and education to build a skilled workforce capable of designing, installing, and maintaining renewable energy systems. This will not only support the growth of the renewable energy sector but also create jobs and foster economic development.

Finally, there is a need for regional cooperation. African countries can benefit from sharing knowledge, resources, and best practices in renewable energy development. Regional initiatives, such as the African Renewable Energy Initiative (AREI), play a crucial role in promoting collaboration and driving the continent's transition to clean energy.

Conclusion

Renewable energy holds the key to Africa's sustainable future. The case study of the Kalobeyei solar mini-grid in Kenya demonstrates the transformative potential of renewable energy in improving lives, fostering economic development, and protecting the environment. As Africa continues to grow and develop, the adoption of renewable energy will be essential in addressing the continent's energy needs while mitigating the impacts of climate change. The time to act is now, and with the right policies, investments, and partnerships, Africa can lead the way in the global transition to a sustainable energy future.

The Critical Role of Data Analytics in Enhancing Cybersecurity in the US Financial Sector: Lessons for Africa

By Oluwabusayo Adijat Bello,a Data Analyst at Northern Trust, USA. She is vast in advanced analytics and applied economics.

Oluwabusayo Adijat Bello

In an era where digital transformation is reshaping industries, the importance of cybersecurity has never been more paramount, especially in the financial sector. Advanced analytics and applied economics play crucial roles in fortifying cybersecurity measures, safeguarding sensitive data, and ensuring the stability of financial systems. The experiences and strategies developed in the United States provide valuable lessons for Africa as it navigates its own digital transformation in the financial sector.

The Role of Data Analytics in Cybersecurity

Cybersecurity in the financial sector involves protecting systems and data from cyber threats, which have become increasingly sophisticated. Data analytics, particularly advanced analytics, is indispensable in this effort. By analyzing vast amounts of data, financial institutions can detect patterns, identify anomalies, and predict potential cyber threats before they materialize.

Predictive Analytics: Advanced analytics uses machine learning algorithms to predict future cyber threats based on historical data. These predictive models help institutions anticipate attacks and strengthen their defenses proactively. For instance, a 2019 study by Accenture found that organizations using advanced analytics in their cybersecurity strategies reduced the average cost of cybercrime by 15%.

Real-Time Monitoring: Continuous monitoring of network activities using data analytics tools enables real-time threat detection and response. This is crucial for minimizing the impact of cyber attacks. According to a 2020 report by IBM, real-time monitoring and analytics can reduce the average time to identify and contain a breach from 280 days to 206 days, resulting in significant cost savings.

Behavioral Analysis: Understanding the behavior of both users and systems through data analytics helps in distinguishing between normal and suspicious activities. By establishing behavioral baselines, financial institutions can detect deviations that may signify a cyber attack. The Financial Services Information Sharing and Analysis Center (FS-ISAC) reported that institutions using behavioral analytics experienced a 20% decrease in successful cyber intrusions.

The Intersection of Applied Economics and Cybersecurity

Applied economics provides a framework for assessing the cost-effectiveness of cybersecurity measures. It helps institutions allocate resources efficiently, ensuring that investments in cybersecurity yield the highest returns in terms of risk reduction.

Cost-Benefit Analysis: Applied economics enables financial institutions to conduct cost-benefit analyses of various cybersecurity strategies. The Ponemon Institute's 2020 Cost of a Data Breach Report highlights that organizations that conduct these analyses save an average of $1.2 million per breach compared to those that do not.

Risk Management: Economic principles are used to assess and manage risks associated with cyber threats. This involves evaluating the likelihood and potential impact of different types of attacks and prioritizing mitigation strategies accordingly. The 2020 Global Risk Report by the World Economic Forum emphasizes that effective risk management can reduce the financial impact of cyber threats by up to 30%.

Incentive Structures: Creating economic incentives for cybersecurity compliance can enhance overall security. For example, institutions might offer bonuses for employees who adhere to best security practices or penalties for non-compliance. This economic approach encourages a culture of security within organizations.

Lessons for Africa

As Africa's financial sector undergoes digital transformation, there are valuable lessons to be learned from the US experience in integrating advanced analytics and applied economics into cybersecurity strategies:

☞ **Investment in Advanced Analytics:** African financial institutions should invest in advanced analytics capabilities. According to McKinsey, banks that leverage advanced analytics can increase their revenue by up to 20% while reducing costs by 15-25%. By investing in these capabilities, African institutions can enhance their ability to detect and respond to cyber threats.

☞ **Economic Assessment of Cybersecurity:** Applying economic principles to cybersecurity can help African institutions make informed decisions about resource allocation. The International Monetary Fund (IMF) estimates that efficient cybersecurity investments can mitigate up to 70% of potential cyber risks. Conducting cost-benefit analyses and risk assessments ensures that investments in cybersecurity are both effective and efficient.

☞ **Developing Comprehensive Cybersecurity Frameworks:** Collaboration between financial institutions, regulatory bodies, and industry groups in Africa can lead to the development of comprehensive cybersecurity frameworks. The African Union's 2020 Cybersecurity Strategy emphasizes the importance of such frameworks in creating a robust defense against cyber threats.

☞ **Education and Training:** Raising awareness and educating financial professionals about cybersecurity risks and best practices is crucial. The Global Cybersecurity Index by the International Telecommunication Union (ITU) ranks African countries lower in cybersecurity awareness compared to global standards. Implementing training programs and workshops can bridge this gap and ensure that employees are equipped to handle potential threats.

☞ **Incentivizing Compliance:** Offering incentives for cybersecurity compliance can motivate institutions to adopt best practices. Recognizing and rewarding compliance efforts can foster a culture of security awareness and responsibility. A 2019 survey by Deloitte found that 60% of organizations with incentive programs for cybersecurity reported higher compliance rates.

Conclusion

Data analytics and applied economics are at the forefront of enhancing cybersecurity in the US financial sector. By predicting and mitigating cyber threats, these disciplines help safeguard sensitive data and ensure the stability of financial systems. The experiences and strategies developed in the United States offer valuable lessons for Africa as it embarks on its own digital transformation journey.

As African financial institutions invest in advanced analytics and apply economic principles to cybersecurity, they can build more resilient and secure financial systems. The integration of these disciplines will not only protect against cyber threats but also promote sustainable economic growth and development across the continent. By learning from the US experience, Africa can create a secure and prosperous future for its financial sector in the digital age.

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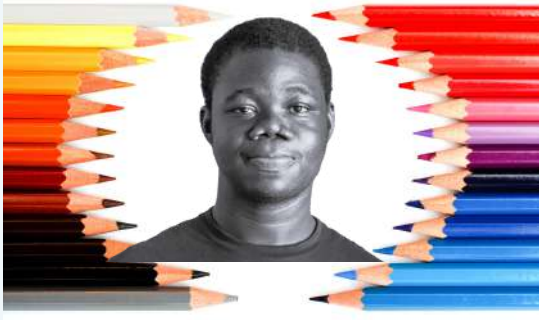
Emmanuel Devi is a passionate software developer and project manager, deeply committed to advancing healthcare and enhancing the quality of healthcare systems. He is the co-founder of Dataleap Technologies, a start-up dedicated to revolutionizing healthcare in Ghana through innovative solutions.

Q What inspired you to create Kulobal Health (MEDBOX), and how did you identify the need for such a solution in the healthcare industry?

A Many patients in Ghana diagnosed with chronic diseases lack effective means for pharmacies or healthcare institutions to monitor their vitals. According to a report by the Ghana Health Service, 40% of adults with hypertension are unaware of their condition due to limited access to monitoring devices like blood pressure and blood sugar monitors. This lack of continuous monitoring leads to high rates of complications and unexpected deaths. During my journey as a software developer and product designer for pharmacy software, I discovered that many patients who frequently visit pharmacies have poor vital signs because they cannot monitor their health. Even when monitoring is available, records are often not maintained or communicated effectively to their pharmacists, exacerbating the problem.

Q Can you walk us through how MEDBOX works, from recording a patient's vitals to transmitting the data to healthcare professionals?

A MEDBOX is an innovative healthcare monitoring system designed to improve patient care by recording and transmitting vital signs data to healthcare professionals for remote analysis and advice. Here's how it works:

▷ Recording Vitals: The system uses sensors to monitor and record vital signs such as blood pressure, heart rate, blood oxygen levels, and temperature.

▷ Data Transmission: Once the vitals are recorded, the data is securely transmitted to a central database. This transmission can occur via mobile networks or internet connections, ensuring that data reaches healthcare professionals in real-time.

▷ Remote Monitoring: Healthcare professionals access the transmitted data through a dedicated platform. This allows them to review the patient's vitals remotely, identify any abnormalities, and provide timely medical advice.

▷ Patient Feedback: The system is designed to facilitate communication between patients and healthcare providers. If any concerning trends are identified, healthcare professionals can immediately reach out to the patient for further instructions or to recommend in-person visits if necessary.

▷ Data Security: MEDBOX ensures that all patient data is encrypted and securely stored, complying with medical data protection standards to maintain patient confidentiality.

Kulobal Health aims to address the challenge of monitoring chronic disease patients in regions where access to healthcare facilities and regular monitoring equipment is limited. By enabling continuous remote monitoring, MEDBOX helps in early detection of potential health issues, ultimately reducing the incidence of emergency situations and improving overall patient outcomes.

Q What challenges did you face during the development of MEDBOX, and how did you overcome them?

A During the development of MEDBOX, we overcame challenges including complex sensor integration through modular design, ensured data security with end-to-end encryption and compliance with standards, facilitated user adoption through user-centric design and comprehensive training, addressed connectivity issues with offline functionality and low bandwidth optimization, and secured funding by participating in innovation competitions and applying for grants. After going through research, we identified a Vital monitoring device Company in China who have already solved our sensor issue so we decided to stop manufacturing our device and work through a partnership with the company.

Q How do you envision MEDBOX transforming healthcare access, especially for chronically ill patients who might struggle with frequent hospital visits?

A We envision transforming healthcare access for chronically ill patients by providing continuous, remote monitoring of vital signs, which reduces the need for frequent hospital visits. MEDBOX allows patients to have their health data automatically recorded and transmitted to healthcare providers, ensuring timely intervention and management of chronic conditions. This system empowers pharmacies to play a proactive role in patient care, enhancing the collaboration between pharmacies and hospitals.

Additionally, MEDBOX improves patient engagement by enabling them to take an active role in their health management, fostering a stronger relationship with healthcare providers. By optimizing healthcare resource utilization and providing valuable data insights, MEDBOX not only enhances the efficiency of healthcare delivery but also improves health outcomes and overall quality of life for chronically ill patients. This integrated approach significantly eases the burden on patients, making healthcare more accessible and manageable.

Q With the integration of MEDBOX Healthcare Access, how do you see the relationship between pharmacies, hospitals, and patients evolving?

A The integration of MEDBOX Healthcare which is now (Kulobal Health) access will enhance collaboration between pharmacies and hospitals, improve patient monitoring and engagement, optimize healthcare resource utilization, and provide valuable data insights like patient allergies records current medications , medical conditions etc, leading to more efficient and effective patient care, better health outcomes, and a stronger relationship between healthcare providers and patients.

Q What's been the most rewarding feedback you've received from users of MEDBOX, and how has it influenced your future plans for the system?

A We have received highly insightful feedback from pharmacies, indicating that our platform provides them with valuable information about patient progress that they previously did not have. This has led to them paying closer attention to these patients. Additionally, chronic patients have expressed that our mobile app has enabled them to track their medications and take them on time. These rewarding responses have motivated us to develop the platform to its fullest potential.

Q What future innovations or improvements do you have in mind for MEDBOX? Are there any upcoming features or expansions you are particularly excited about?

A The MEDBOX project is now renamed to Kulobal Health, which is currently focusing on providing software services to pharmacies to address critical drug-drug interaction (DDI) needs with advanced data integration and large language models (LLMs), offering a real-time, patient-specific solution. This improvement will help community pharmacies do the following:

- Maintain detailed patient records, including medication history and allergies.
- Ensure accurate and safe medication dispensing.
- Minimize the risk of adverse drug interactions.

Q On a lighter note, when you're not busy revolutionizing healthcare at Dataleap Technologies, how do you unwind?

A Mostly you will find me watching a movie, practising some kizomba moves or reading a publication on Health Technologies around the World.

MEDBOX: Saving Time, Cutting Costs, Easy to Use
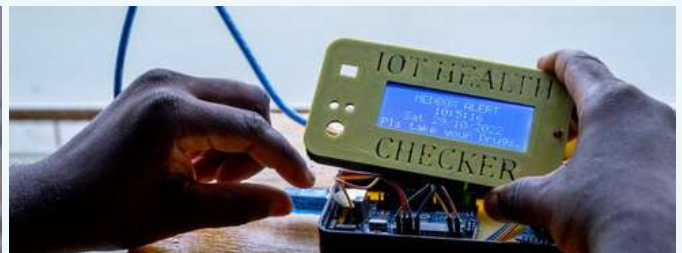
ATPS Leads Stakeholder Sensitization Workshops on Climate Action

The African Technology Policy Studies Network (ATPS), in collaboration with the Pan African Climate Justice Alliance (PACJA) and the West African Green Economy Development Institute (WAGEDI), hosted pivotal Stakeholder Sensitization Workshops on June 25-26, 2024. These workshops are part of the project titled "Building the Capacity of Selected sub-Sahara African Countries to Effectively Measure Progress in their Nationally Determined Contributions' Implementation Using Tracking Tools and Indexes." This project is generously funded by the African Development Bank (AfDB) through the African Climate Change Fund (ACCF).

The workshops aimed to bolster the capacity of selected sub-Saharan African countries in monitoring and implementing their Nationally Determined Contributions (NDCs). These contributions are essential to aligning national policies with the global climate goals outlined in the Paris Agreement.

The project is crucial in addressing the challenges faced by African nations in effectively tracking their progress in reducing greenhouse gas emissions and adapting to the impacts of climate change. By providing targeted training and introducing advanced tracking tools and indexes, the initiative seeks to ensure that African countries not only meet but exceed their climate commitments.

To further support this effort, ATPS and its partners have published NDC training manuals in both English and French, which are now available to stakeholders across the continent. These manuals are designed to provide practical guidance and best practices in the measurement and reporting of climate action. Get a copy of the training manuals here: https://atpsnet.org/atps-afdb-accf-ddw-ndc-project/

As the global community intensifies its focus on climate change, initiatives like these underscore Africa's commitment to leading the charge in climate action. The workshops not only facilitated knowledge sharing but also strengthened partnerships among various stakeholders, ensuring a unified approach to achieving sustainable development and climate resilience in the region.

Step Change Webinar Explores Crucial Roles of Intermediaries in Climate Adaptation

Prof. Nicholas Ozor, the Executive Director of the African Technology Policy Studies Network (ATPS), was among the distinguished speakers during the Step Change webinar held on August 1st, 2024. The webinar, titled "Grant-makers, Facilitators, and Communicators: Exploring the Many Roles of Intermediaries in Locally Led Adaptation," brought together experts to discuss the crucial roles intermediaries play in advancing climate resilience at the local level.

Step Change, a Canada-Netherlands partnership, is dedicated to promoting equitable and inclusive locally-led adaptation, with a focus on improving the quality of life and resilience of those most affected by climate change. During the webinar, Prof. Ozor highlighted the critical work of ATPS as the leading institution in the "Strengthening the Capacity of the Extension System to Use Proven Knowledge and Technologies to Sustain Equitable Locally Led Adaptation Among Smallholder Farmers (SCALE)" project.

This initiative is part of Step Change's broader efforts to empower smallholder farmers across Africa by enhancing their ability to adapt to climate challenges through proven knowledge and technologies.

The impact of the webinar was significant, as it facilitated a robust exchange of ideas and strategies among grant-makers, facilitators, and communicators, all of whom play vital roles in bridging the gap between climate science and local adaptation practices. Participants gained valuable insights into the importance of intermediaries in ensuring that locally-led adaptation efforts are not only effective but also sustainable and equitable.

Prof. Ozor's contributions underscored the need for stronger collaboration between stakeholders to support smallholder farmers, who are on the front lines of climate change. The webinar concluded with a renewed commitment to fostering partnerships that prioritize the voices and needs of local communities in the fight against climate change.

ATPS Publishes Training Manual to Strengthen Climate Action Tracking in Africa

The African Technology Policy Studies Network (ATPS) is making strides in advancing climate action across Africa through its Nationally Determined Contributions (NDCs) Project. This initiative aims to bolster the capacity of 12 selected sub-Saharan African countries (Botswana, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Namibia, Nigeria, Sierra Leone, Tanzania, Uganda, Zambia and Zimbabwe) to effectively monitor and track their progress in implementing NDCs, which are critical commitments under the Paris Agreement.

The NDCs Project equips these countries with advanced monitoring and tracking tools, enabling them to measure their performance across key areas, including Governance, Finance, Mitigation, Adaptation, and Measurement, Reporting & Verification (MRV). By utilizing these tools, nations can gain a clearer understanding of their climate actions and make informed decisions to enhance their impact.

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One of the significant outputs of this project is the recently published "Monitoring the Implementation of the NDCs of African Countries using Tracking Tools and Indexes – Training Manual." Now available on the ATPS website, this manual provides comprehensive guidance on how to effectively use these tools to drive climate action. The manual is designed to support stakeholders at various levels, from policymakers to on-the-ground practitioners, ensuring that all involved can contribute to the successful implementation of NDCs.

The publication of this training manual marks a crucial step forward in Africa's journey toward sustainable development and climate resilience. By empowering countries with the knowledge and tools to track their progress, the NDCs Project is helping to shape a more accountable and effective approach to climate action across the continent. To learn more and access the training manual, visit the ATPS website https://atpsnet.org/atps-afdb-accf-ddw-ndc-project/

Webinar Highlights Gender-Inclusive AI Innovation for African Agriculture

On July 12th, 2024, the African Technology Policy Studies Network (ATPS), in collaboration with its partners, hosted a pivotal dissemination webinar under the AI4AFS-AI4D Gender Innovation Project. The event, titled "Bridging the Gender Gap in Agriculture with AI: Insights and Best Practices," marked the conclusion of the AI4D Innovation Grant aimed at empowering women and marginalized communities in Africa's agriculture and food systems through artificial intelligence (AI) technology.

The project, a collaborative effort between ATPS, the International Centre of Insect Physiology and Ecology (icipe), and Kumasi Hive, with support from donors including IDRC, Women at the Table, Gender at Work, and LadySmith, focused on addressing the persistent gender disparities in African agriculture. Women, who make up 60% to 80% of the agricultural workforce in Africa, face significant challenges in accessing technology, land, financial resources, and education. The AI4AFS-Gender Innovation Project sought to bridge these gaps by ensuring that AI technologies promote gender equity and social inclusion, rather than exacerbating existing inequalities.

A highlight of the webinar was the discussion of the "design by inclusion" methodology, a central approach of the project. This participatory method involved the active engagement of women and marginalized communities in the design, development, and deployment of AI tools, ensuring that the technologies developed were relevant, accepted, and effective. The project demonstrated that inclusive design significantly enhances the adoption of AI technologies among women and marginalized farmers, as evidenced by successful case studies from Nigeria and Uganda.

The webinar also featured the introduction of the GEDI (Gender Equity, Diversity, and Inclusion) Framework, developed through the project to guide the integration of gender considerations into AI applications. This framework sets a precedent for future technological interventions in the agricultural sector, emphasizing the importance of involving end-users throughout the AI development process.

Participants in the webinar, including policymakers, AI developers, researchers, and civil society organizations, were provided with key findings, best practices, and policy recommendations for gender-inclusive AI adoption in agriculture. The event concluded with a call to action for continued collaboration among stakeholders to ensure the sustainability and scalability of the project's outcomes. The dissemination of the AI4AFS-Gender Innovation Project's results marks a significant step forward in promoting sustainable and inclusive growth in African agriculture. The lessons learned and tools developed through this project are expected to have a lasting impact on the empowerment of women and marginalized communities across the continent.

Watch the Webinar here: https://www.youtube.com/watch?v=fNgw2jueg6I

Training Empowers Stakeholders to Advocate for AI in Agriculture Through Effective Policy Briefs

From July 25th to 26th, 2024, a specialized training workshop was held to equip participants with the skills and knowledge necessary to develop compelling, evidence-based policy briefs. The primary focus of the training was to enhance advocacy for the adoption of Artificial Intelligence (AI) in Africa's agricultural sector, ensuring that its transformative benefits are fully realized.

The training was specifically targeted at the ATPS Managing Organization (Hub) for Responsible Artificial Intelligence for Agriculture and Food Systems (AI4AFS) Innovation Research Network in Africa Project Grantees. These 10 grantees from eight African countries (Cape Verde, Ghana, Kenya, Malawi, Nigeria, Senegal, Tanzania, and Uganda) have already developed AI and machine learning tools to address various agricultural challenges in their respective countries. Watch these videos to learn more about their projects:

https://www.youtube.com/watch?v=45EXXIfT9As&list=PLHhVJzapw0Q0bOeWZwy6USNpqW6Cn-tC5

The workshop emphasized the importance of effectively communicating the potential of AI in Agriculture and Food Systems to key stakeholders. Participants were provided with the tools and resources necessary to craft persuasive policy briefs that can influence decision-makers and drive positive change within the sector. By making a strong, evidence-based case for AI, the training sought to increase the likelihood of its widespread adoption and impact across the continent.

Throughout the two-day event, participants learned strategies for articulating the advantages of AI in agriculture, such as improving crop yields and enhancing food security. The knowledge gained is expected to empower them to advocate more effectively for AI's role in transforming Africa's agricultural landscape.

Recordings of the training are available on YouTube:

- https://www.youtube.com/watch?v=rLxSfoBfvWA
- https://www.youtube.com/watch?v=JVt0GIbmsNw&t=5s

This workshop represents a vital step in preparing the agricultural sector to harness AI's full potential, paving the way for innovative solutions to address pressing food security challenges across Africa.

Women in Nigeria going through hands on use of the APWENFarm app and Plantix app on 26th May 2024.

Eng. Prof. Joel Nwakaire, Postdoctoral Research Officer at ATPS, during his visit to IPAR (Initiative Prospective Agricole et Rural) in Senegal on 11th September 2024.

ATPS staff during a brainstorming session at the organization's headquarters in Nairobi, Kenya, on 15th September 2024.

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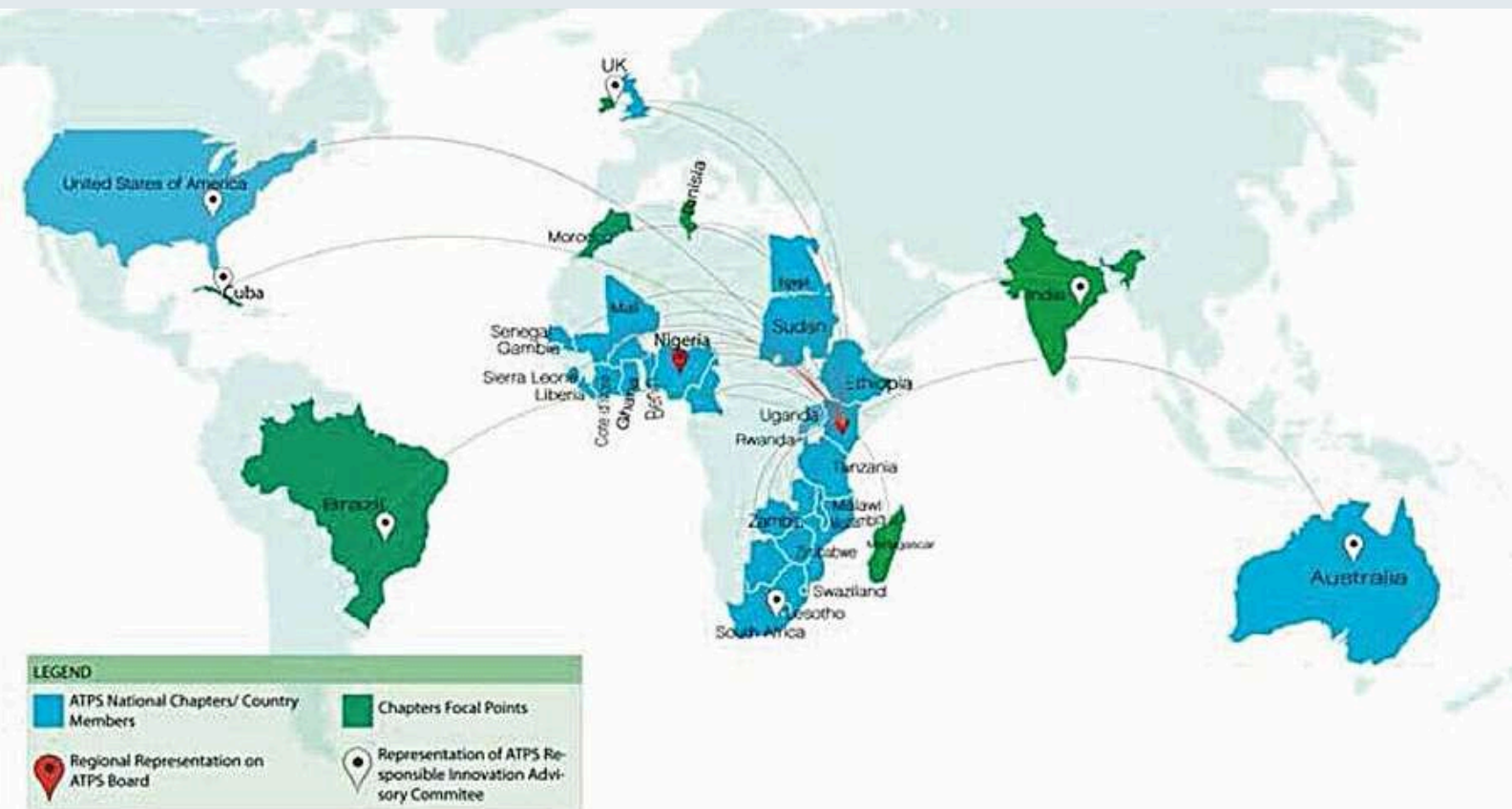
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LEGEND

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- Chapters Focal Points
- Regional Representation on ATPS Board
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