>>> NEWSLETTER <<<

# TECHNOPOLICY AFRICA

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

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By Engr Dr. Joel Nwakaire

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### GLOBAL SOUTH ENERGY

By Dr. Kingsley Ukoba

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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

**Prof. Crispus Kiamba,**
**Chairman, ATPS Board of Directors**

I am delighted to extend a warm welcome to you as we delve into the latest edition of our ATPS Newsletter. As we reflect on the closing of the third quarter of 2023, we find ourselves filled with optimism, buoyed by the progress we've made thus far. Our unwavering commitment to improving the quality of Science, Technology, and Innovation (STI) systems, research, policy, and practice remains steadfast, driving us forward on our journey toward sustainable development in Africa.

In the upcoming months, we eagerly anticipate the release of our Phase IX ATPS Strategic Plan, 2023-2028. This pivotal document will serve as our guide for the next five years, charting the course for our future endeavors in leading STI research, policy, and practice development on the continent.

It represents a culmination of rigorous planning and visioning, considering the dynamic landscape of STI in Africa. This strategic plan not only outlines our organizational goals but also underscores our dedication to continuous improvement and adaptability.

Our engagement with esteemed donor organizations, development partners, and networks continues to strengthen. These collaborative efforts are instrumental in achieving our mission, and we look forward to nurturing these relationships further. Together, we can harness the power of innovation and knowledge to drive positive change and sustainable development across the African continent.

# Executive Director's Message



**Dr. Nicholas Ozor,
Executive Director, ATPS**

I extend a warm and heartfelt welcome to the 21st edition of the Technopolicy Africa Newsletter. It is indeed an honor to address you as we reflect on the remarkable journey of ATPS in the year 2023. As we navigate through this transformative period, our commitment to advancing Science, Technology, and Innovation (STI) in Africa and beyond is unwavering.

In 2023, we have achieved notable milestones, showcasing our dedication to innovation and adaptability. We have proudly introduced new programs and initiatives that resonate with the evolving needs of our stakeholders in the STI ecosystem across Africa and beyond. This year alone, we have introduced more than five new projects aimed at addressing societal challenges at different levels from governmental to community levels including:

- Strengthening the capacity of the extension system to use proven knowledge and technologies to sustain equitable locally led adaptation among smallholder farmers (SCALE).
- Technical Assistance for Intra-ACP Climate Services and Related Applications (ClimSA) Programme.
- Strengthening the Capacity of Women and Marginalized Communities in Africa's Agriculture and Food Systems to Harness the Potentials of Artificial Intelligence Technology.
- Strengthening the National Research and Innovation Funding Agencies in West Africa (SRIFA).

- Building the Capacity of Selected sub-saharan African Countries to Effectively Measure Progress in their Nationally Determined Contributions' Implemention Using Tracking Tools and Indexes

Our outreach efforts have expanded, connecting us with a broader community of innovators, researchers, and thought leaders in the STI landscape. Furthermore, our partnerships with key stakeholders have grown stronger, amplifying our collective impact on the STI ecosystem.

Africa, as well as the global community, faces pressing challenges, from climate change impacts such as drought, flooding, and sea level rise to food and nutrition insecurity, pollution, human insecurity, poverty, and diseases among many others. ATPS recognizes the urgency of these issues and remains steadfast in its mission to drive impactful projects that bring about positive change, improving the lives and livelihoods of people across the continent, and building the resilience of the people to the devastating impacts of climate change using STI as a means. Our recent involvement in the Africa Climate Summit and Africa Climate Week 2023, held in Nairobi, Kenya, reflects our commitment to addressing pressing environmental concerns.

# Empowering Women and Marginalized Communities in Africa to Embrace Artificial Intelligence (AI) Tools

*By Engr. Dr. Joel Nwakaire, Associate Professor and Postdoctoral Research Officer at African Technology Policy Studies Network (ATPS) Nairobi, Kenya.*

Have you ever wondered why the adoption of AI tools is still limited among women and marginalized communities in Africa? As we strive to bridge the digital gender divide and create opportunities for all, it is crucial to build inclusive solutions that cater to the specific needs and challenges faced by these individuals. Let's explore how Design by Inclusion can play a pivotal role in improving AI tool adoption in Africa and uplifting the voices of those often overlooked.

Design by Inclusion emphasizes developing products and solutions that consider the diverse backgrounds, experiences, and abilities of its users. By placing such inclusive design principles at the forefront, we can remove barriers, reduce biases, and ensure the meaningful participation of women and marginalized communities in Africa in the AI revolution.



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## Why does it matter?

To promote adoption and create a supportive environment, collaborations and partnerships among various stakeholders are crucial. Governments, NGOs, tech companies, and local communities should come together to provide training programs, mentorship initiatives, and awareness campaigns that specifically target women and marginalized groups. By building digital skill sets and boosting confidence, we empower individuals to engage confidently with AI tools and enhance their prospects in a rapidly evolving job market.

Let's not forget the power of representation. By incorporating diverse perspectives in AI tool development teams, we foster an environment that understands and caters to the unique needs of women and marginalized communities. Ensuring that these individuals are involved in shaping the future of technology ensures that no one gets left behind.

## Our responsibility!

Design by Inclusion is not only ethically sound but also leads to more effective and successful AI tool adoption. Let's work together to inspire change, break down barriers, and create a future where women and marginalized communities in Africa can harness the potential of AI to improve their lives and communities.

# Industrialization, Climate Change, and Energy Security in The Global South

*By  Dr. Kingsley Ukoba, E4C fellow (ASME); UNEP African Assessment Report Author & African Renaissance doctoral fellow alumnus (World Academy of Science (TWAS/NRF)|| Energy, Climate Change, 3D printing, Data Analyst& Sustainable Development, ML*

Industrialization, energy security and climate change are interconnected terms that forms the core of development of modern society. Unstable, expensive electricity supply is affecting the global south adversely. Companies and entrepreneurs are folding up and some relocating to other regions owing to high cost, unavailability of energy to break-even. Energy security is needed for industrialization to succeed. Although, industrialization is the key to wealth and better living, it affects the environment and ultimately contributes to climate change. Therefore, there is need to examine the interplay of energy security and climate change and the impact on industrialization. This forms the essence of this article.

Industrialization is the transformation of an economy with emphasis on mass production and automation. A crucial element of this change is the use of automated mass production techniques. It alludes to the shift from an economy based on manual work to an industrial society powered by machine labor. It entails a methodical transition from an agrarian economy to one based on sophisticated mechanical mass production. Energy is crucial element needed to achieve industrialization.

Energy security, according the International Energy Agency, or IEA, is the continuous access to energy sources at competitive prices. There are numerous facets to energy security: Long-term energy security primarily involves making timely investments to supply energy in accordance with societal demands and prevailing economic conditions.

The relationship between national security and the accessibility of natural resources for the production of energy is known as energy security. The ability to access cheaper energy has become crucial to the operation of contemporary economies. Energy is a key driver of growth and economic development. A clean, sustainable and efficient energy is vital for accelerated and uniform development of a region. Global south's energy is dominated by fossil-based energy. Premium Motor spirit (PMS), diesel, kerosene are major sources of greenhouse gas emission. The transport, domestic, and industrial sector of global south relies heavily on PMS, diesel, kerosene, wood for their energy needs. The effect of these sources on climate has resulted in massive flooding, unpredictable weather pattern, fire incidences among others. Worse is the high cost, unstable, unavailability of these sources of energy in global south. This has resulted in several business either collapsing or moving to neighboring countries or regions. Domestically, this fossil-fuel has caused death, respiratory diseases and untold hardship to Global south populace.

Climate change affects the social and environmental determinants of health including clean air, safe drinking water, among the like. The effect of climate change is causing the warming of the Earth by 1.1°C as opposed to what it was in the late 1800s, and emissions are rising. It has been suggested that to avoid further warming and preserve a livable planet, global temperature increase needs to be limited to 1.5°C above pre-industrial levels. To keep global warming to no more than 1.5°C - as called for in the Paris Agreement - emissions must decrease by 45% by 2030 and reach net zero by 2050. This has made most developed countries develop technology and processes that will eliminate greenhouse gas emissions by 2050. The United Nations launched a NetZero Coalition that united countries that have committed to achieving net-zero greenhouse gas (GHG) emissions by 2050. This is with a view to limiting the global temperature rise to 1.5°C. Countries committed to the net-zero GHG emission developed policies and ensure strict compliance by public and private sectors of climate change. In some cases, professional organizations implement the same. Professional organizations such as the American Civil Engineering have policies and strict regulations to ensure climate change in infrastructure and all aspects of their sector.

However, regions in the global south such as Sub-Sahara Africa (SSA) still struggle with achieving net-zero GHG emissions. The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations. IPCC's job is to advance scientific knowledge about climate change caused by human activities. The 2023 IPCC report on climate change shows that developing countries will need about 127 billion US dollars per year by 2030 and 295 billion US dollars per year by 2050 to adapt to climate change (Boehm and Schumer, 2023). This is way higher than the 26 billion US dollars and 46 billion US dollars committed for 2017 and 2018 respectively.

**Way forward for Global South Industrialization, energy security and climate change**

Achieving energy security will translate to industrialization but not necessarily achieving climate change. A consented effort aims at shifting away from fossil-based fuel to green energy that will guarantee energy security, industrialization, and net zero emission (climate change). It therefore means a clean, affordable, and sustainable energy will unlock the three key terms for the global south.
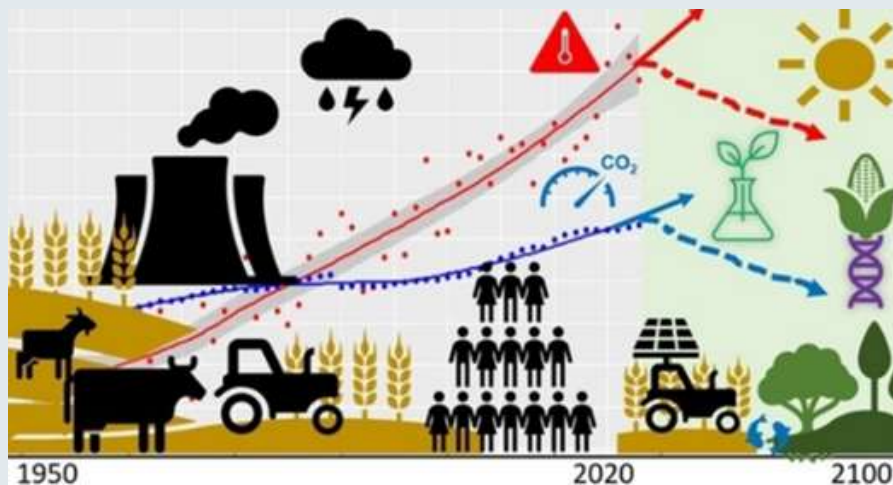


*Figure. Sustainable Agro-Food Systems for Addressing Climate Change and Food Security (Wijerathna-Yapa, and Pathirana, 2022)*

Fortunately, regions in the global south have the natural endowment to deploy green energy. Sub-Saharan Africa has abundant resources to deploy solar energy, hydropower, wind, biofuel, and piezoelectric energy. Most of these energy sources have little maintenance with uninterrupted supply.

Hence, an aggressive, consented investment in research and development of the mentioned green energy backed with the appropriate policy formulation and implementation and enabling environment will accelerate industrialization, energy security, and climate change in the global south, especially in Sub-Sahara Africa.

Global South has the required natural endowment to birth industrialization by leveraging the huge green energy potential available in the region. Solar energy, biofuel from waste using gasification, wind, and tidal turbines, among others, can accelerate energy security in the global south. Clean energy will bring about industrialization and the attainment of net-zero emissions. Policy formulation, implementation, and strict compliance alongside the enabling environment will also be needed for the attainment of industrialization, energy security, and climate change in the global south especially regions like Sub-Sahara Africa.

# Utilization of Overripe Plantain Puree for Bakery Products in Ghana



*By Evelyn Serwah Ayeh, Senior Research Scientist with CSIR-Food Research Institute of Ghana. Currently a PhD candidate with the Kwame Nkrumah University of Science and Technology, a member of the Ghana Science Association, a member of the African Women in Agribusiness, and a fellow of the African Technology Research Institute.*

Plantains are a staple food for many people in the developing world. They are cheap, easy to grow, and rich in carbohydrates, fibre, vitamins and minerals. However, when plantains ripen beyond their usual consumption stage, they become soft, sweet and blackened, making them less appealing. Many individuals end up discarding overripe plantains, wasting valuable food and resources. Could there be a way to use overripe plantains to make delicious and nutritious bakery products?

Bakery products have long been cherished as delightful treats that satisfy our taste buds. However, the excessive use of refined wheat flour and sugar in these products has raised concerns about their impact on health. In recent years, there has been a growing interest in finding healthier, more sustainable and cost-effective alternatives.

Overripe plantain puree (OPP) has emerged as a promising solution, offering several benefits for both consumers and bakers. OPP is a product obtained from the pulp of overripe plantain, a type of starchy fruit belonging to the banana family. The production of OPP does not require sophisticated equipment. A food processor or blender, knives, and utensils are the basic tools to process the raw material.

Bakers can create a wide range of pastries and other baked goods by combining plantain puree with traditional ingredients. OPP serves as a partial substitute for wheat flour and sugar in bakery products, like bread, biscuits, cookies and cakes, to improve their nutritional quality and reduce their cost. Incorporating overripe plantain puree into bakery products also opens the door to exciting flavour possibilities. The unique taste of plantains can make a final product even more enticing with a fresh and distinct experience.

How beneficial is the use of overripe plantain puree to the African bakery Industry?

One of the main advantages of using overripe plantain puree in bakery goods is its ability to replace a portion of flour. Although wheat flour is commonly used in baked goods, its high glycaemic index can cause blood sugar levels to spike. With the addition of plantain puree, the final product's glycaemic load can be reduced, making it a suitable option for people managing their blood sugar levels or those with diabetes. The fiber content of the puree can help maintain the moisture retention and texture of baked goods. It may also help extend their shelf life.

Since overripe plantains are naturally sweet, they offer an opportunity to reduce the amount of refined sugar in bakery products. With the use of plantain puree as a sweetening agent, bakeries can achieve the desired sweetness level while reducing the sugar content. This is particularly beneficial since the link between excessive sugar consumption and health problems like obesity and poor oral health has been established. Thus, the utilization of OPP in bakery products can potentially reduce the production cost of wheat flour and sugar by up to 50% and 100%, respectively.

Another advantage of using overripe plantain puree is its sustainability and cost-effectiveness. Plantains are a widely available and relatively inexpensive fruit in many parts of the world. Utilizing overripe plantains that might otherwise go to waste aligns with efforts to reduce food waste and make the most of available resources. This can contribute to a more sustainable food production system and potentially lead to cost savings for both consumers and producers.

As the demand for healthier and more sustainable food options continues to rise, overripe plantain puree stands out as a versatile and beneficial ingredient in bakery products. Its nutritional richness, potential for reducing the glycemic impact, and ability to lower sugar content make it a valuable addition to the culinary landscape. Bakers and consumers alike can enjoy the benefits of this innovative ingredient, fostering a shift towards more health-conscious and environmentally friendly baking practices. Through the creation of new opportunities for innovation and product development in the bakery industry, OPP is helping to reduce food waste, save money, and provide nutritional benefits to consumers

# Crop/Pest Detection with Deep Learning

*By Dr. Patrick Kwabena Mensah a Ghanaian and a Senior Lecturer at the Department of Computer Science & Informatics; University of Energy and Natural Resources (UENR) – Ghana. He has PhD, MSc, and BSc in Computer Science and also holds an HND in Electrical/Electronic Engineering.*

In recent years, the global agricultural landscape has undergone a transformative shift, driven by technological advancements. One such innovation that holds tremendous potential is the application of artificial intelligence-based crop pest and disease detection. Traditional farming practices often rely on manual observation and intervention, leading to high costs, time-wasting, and yield losses. Deep learning offers a promising solution to these challenges by enabling accurate and timely identification of crop pests and diseases automatically. This article provides an overview of one such application, funded by ATPS, that utilizes deep learning methods on the web and smartphones for crop pest and disease detection.

The Need for Advanced Detection Techniques

Agriculture forms the backbone of many societies in the world, providing food security, finances, and livelihoods to billions of people. However, crops face constant threats from pests, diseases, and adverse conditions that require constant interventions that subsistent farmers may not be capable of providing. Automatic detection could be the first step to early intervention, which remains crucial to the prevention of substantial yield losses and ensuring sustainable food production. Image recognition algorithms, such as Deep Learning (DL), prove highly valuable in this context, stepping in as a game-changer.

DL algorithms are inspired by the human brain's network of neurons that have shown excellent performance in pattern/image recognition and data analysis. We leverage these algorithms to identify pests/diseases in cassava, maize, cashew, and tomato to offer real-time recognition that can empower farmers to make informed decisions.



*Figure 1: Manual identification of crop pests and diseases involves a human expert (and non-experts) whose efficiency may depend on several factors.*

Our team is drawn from academia, and the private sector. Two-thirds of the membership are seasoned Artificial Intelligence researchers who have published extensively in the field. Some of the team members are experts in horticulture and crop production. Two members are from the private sector, specifically, the non-governmental organizations with experience in mobilizing community members for educational and outreach programs.As part of the extended team membership, the project has three crop pests/disease specialists serving as consultants, in addition to three other extension officers. This team membership provided a fertile ground for all aspects of the pests and diseases of these four crops to be considered critically before, during, and after the development phase of the mobile and web applications.

The first stage of the app's development phase was to contact farmers in the four selected geographical regions of Ghana (Bono, Bono East, Ahafo, and Savannah) in the form of community engagement to create awareness, solicit their experience and support, understand their problems relating to pests/diseases of the four crops, and also make them understand that they are important stakeholders in the project's lifecycle (See Figure 2).

In an attempt to bridge the dataset availability gap in Africa and the rest of the world, the consultants accompanied team members to the farms of people in the local communities of the Bono, Bono East, Savannah, and Ahafo Regions of Ghana. At the end of this phase, the team collected over ten thousand images belonging to each disease category, as well as healthy images of each crop. The images were annotated and labeled by the consultants after which image preprocessing was carried out by the deep learning experts in the team.

*Figure 2: Stakeholder engagement at Brodi in the Bono Region of Ghana*

According to "Shrink That Footprint" https://shrinkthatfootprint.com/best-plant-identification-app-and-disease-diagnosis-app/#:~:text=Plant%20disease%20diagnosis%20apps%20are,diseases%20are%20Agrio%20and%20Plantix, there are existing mobile applications for plant identification and disease diagnoses. Google Lens allows one to take a close photograph of a plant and search for matches on the internet that are likely to explain the condition of the plant. Unfortunately, the user needs strong internet connectivity coupled with the fact that it is not every image on the internet that is labeled accurately. PictureThis is an Android/iOS app that can identify different species of plants as well as the diseases affecting the plants. It also provides a comprehensive plant care platform and one-on-one expert consultations. This app, however, is not open source, or disability friendly as the pricing model is unclear and the visually impaired may have trouble navigating through the interfaces. Additionally, it is difficult to use by local farmers since the app's language is English contrasted with the fact that most of our farmers cannot read and write English. Other existing plant disease detection apps include Agrio, Plantix, and Plant Disease Identifier, however, these apps have similar shortfalls as the ones mentioned earlier.

Our plant pest/disease detection mobile app is christened "akuafo adanfo"; farmer's friend. Contrary to the existing apps, it can be used in either English or the local language Twi mode. It has a very simple interface that farmers can easily learn and get used to yet is powerful enough to identify pests/diseases of the four crops. It has the capability to identify both pests and diseases and does not require the internet for its core functionality.

The app employs conversational AI, allowing users to control it using voice commands, making it accessible for individuals with disabilities. When the app is launched, the user can use voice to open every interface that a button can open through touch. Once a plant image is either captured or picked from the phone's gallery for identification, the app performs a quick offline detection with the resulting confidence of detection. The user is then informed by the app through voice as to whether the user should contact a specialist for further verification based on the confidence of detection. If the confidence of detection is below 100%, the app informs the user in the local language that a consultant should be contacted through WhatsApp. When the WhatsApp button is clicked (or mentioned), the app opens the sharing facility of the phone with the image meant to be attached to the consultants whose WhatsApp numbers are already saved on the user's phone during installation. Additionally, the user can push the Control button to open a webpage specific to the type of disease/pest identified detailing both the preventive and control measures. The web version of the apps can be accessed from the mobile app. Just like the mobile app, the web app allows the user to upload an image for detection. The web app is made to accept constant traffic; hence, the app goes to "sleep" anytime it is inactive for hours. Once it detects a user, it wakes up from sleep to perform the detection. The web apps can be accessed at https://cashew.streamlit.app/ for Cashew, https://maizee.streamlit.app/ for maize, https://cassava.streamlit.app/ for cassava, and https://ai4afstomato.streamlit.app/ for tomato.

*Figure 3: Interface of maize web app.*

**Challenges**

Just like every machine-learning classification app, out-of-distribution data are forcibly classified into one of the known categories. However, we trained the AI with other images (called non-type) that are not part of the plant disease datasets used for training. As a result, if the app is tested with the image of keys, or other images that are not plant images, instead of classifying it as one of the crop diseases/pests, the app is able to tell the difference. Notwithstanding, there are occasions when the app produces the wrong output, which it partially corrects by informing the user of its lack of confidence and the necessity to do further verification from a human expert.

**Advantages and Opportunities**

The bright side of this is that the app can be scaled up by training with massive datasets comprising many plants and many diseases of the plants. The app is free, disability friendly, has a man-in-the-loop ability for instant feedback, speaks in the Twi language, and works offline.

# Rethinking Food Sovereignty in building resilient food and nutrition systems in Africa

*By Dr (Mrs) Wilhelmina Quaye, Director, CSIR-Science and Technology Policy Research Institute, Ghana*

COVID-19 has exposed the weaknesses in food and nutrition systems in Africa and the dangers of overreliance on not only the importation of food products but also agricultural inputs. For example, the importation of rice, wheat, and fertilizers. This is a huge concern to all responsible actors in the food and agriculture and nutrition value chain, bringing into sharp focus the need to rethink the concept food sovereignty. Over the years, the concept of food sovereignty has been misunderstood by certain actors within the food, agriculture, and nutrition ecosystem. Food sovereignty is a people-driven concept that places a significant responsibility on all participants in the food and nutrition value chain, including producers, processors, service providers, traders, exporters, importers, policymakers, and consumers, to act responsibly and sustainably.

The concept of Food Sovereignty has been inspired by some key principles including the following:

1. **Reorganizing food trade**. Food is first and foremost a source of nutrition and only secondarily an item of trade. National agricultural policies should prioritize production for domestic consumption and food self-sufficiency; food imports should neither displace local production nor depress local prices.

2. **Democratic control**. Smallholder farmers should have direct input into formulating agricultural policies at all levels.

3. **Food: A basic human right**. Everyone should have access to safe, nutritious, and culturally appropriate food in sufficient quantity and quality to sustain a healthy life with full human dignity. A nation should declare access to food as a constitutional right and guarantee the development of the Food and Agriculture and Nutrition sector to ensure the concrete realization of this.

4. **Agrarian reform**. An authentic agrarian reform is essential, granting landless and farming communities, particularly women, ownership and control over the land they cultivate, while also restoring territories to indigenous peoples. The right to land should be free from discrimination based on gender, religion, race, social class, or ideology; the land belongs to those who cultivate it.

5. **Protecting natural resources**. Food sovereignty entails the ongoing care for and sustainable use of natural resources, especially land, water, seeds, and livestock breeds. The people who work the land should have the right to practice sustainable management of natural resources and to conserve biodiversity free of restrictive intellectual property rights. This can only be achieved with a secure economic foundation that includes tenure security. Prioritizing healthy soils and reducing the use of agrochemicals is essential.

6. **Social peace**. Everyone has the right to live free from violence, and food should never be used as a weapon. Rising levels of poverty and the marginalization of rural areas, coupled with increasing oppression of ethnic minorities and indigenous populations, exacerbate situations of injustice and despair.

The principles behind food sovereignty may be seen by many as more of a socialist approach to reclaim autonomy over food systems and focus on natural resources management for sustainable agricultural production, and food and nutrition security. Nevertheless, it is imperative to acknowledge the importance of local ownership of food production and consumption, as well as the need to build capacities and resilience to reduce dependence on food imports. As a continent, we should add value to raw food products, develop a taste for local foods, and create the necessary demand conditions to encourage local production. All these have been brought to the fore for constructive discussions relating to the development of food policies to achieve food sovereignty on the African continent.

# Unlocking Sustainable Livelihoods: A Study on Resource Base, Climate Change, and Population Growth in Ethiopia

*By Costantinos Berhutesfa Costantinos, PhD Lem
Ethiopia, the Environment and Development Society.*

In a quest to understand the intricate relationship between resource availability, climate change variability, and population growth, a groundbreaking study was conducted in twelve communities spanning the Amhara and Oromia Regional States of Ethiopia. The study aimed to shed light on the complex dynamics influencing livelihood security in these regions and identify potential solutions to address pressing challenges.

## The Study Area

The study area encompassed six communities: Fikre Selam, Gosh Wuha, Kara Amba, Kokeb Mesk, Lamgeno, and Salayish in Amhara, and Dire Doyo, Girar Geber, Gishe Uosmani, Torban Ashe, and Wertu in Oromia. Situated at altitudes ranging from 1300 to 2600 meters, the region experiences bimodal rainfall distribution, with 'Kiremt' season from August to September and 'Belg' rains from March to May. Over the past three decades, the area has witnessed an average annual rainfall of approximately 1200 mm and an annual average temperature of 14.8°C.

## Methodology

The study employed a multi-faceted approach, including participatory tools, semi-structured interviews with 566 household heads, focus group discussions, and key informant interviews. These inquiries delved into demographic characteristics, agricultural and livestock production, social service infrastructure, off-farming activities, forest resource management, and soil and water conservation. Climatic data spanning three decades, satellite imagery, population census records, and existing research in the study areas complemented the primary data collection.

## Key Findings

**Livelihood Constraints:** The study revealed that land shortage, erratic rainfall, lack of improved farming technologies and agricultural inputs, shortage of livestock feed, diseases, and limited access to veterinary services were the major constraints to livelihood security.

**Energy Source:** Over 73% of the domestic energy requirement in the region is met through woody biomass, highlighting the area's heavy reliance on this energy source.

·**Climate Impact:** Analysis of rainfall variability, temperature trends, and potential evapotranspiration indicated a crop-growing period of five to six months, suitable for double cropping of short to medium crops. However, severe impacts on crops were observed during rainfall-deficient years and rising annual average temperatures.

**Population Pressure:** Land scarcity, exacerbated by rapid population growth (2.9%), emerged as a significant challenge, with a typical household unable to provide adequate land for future generations.

**Climate Vulnerability**: Climate variability posed a substantial threat to agricultural production, with 81% of respondents citing issues like erratic rain, temperature increases, frost, and rain shortages. This, in turn, led to reduced food availability, increased living costs, livestock feed shortages, and cattle losses.

## Conclusion and Recommendations

The study underscores the urgency of implementing conservation-oriented land resources management and sustainable farming practices. To mitigate the adverse effects of population growth and shrinking land holdings, measures must be taken to control the high population growth rate in the region.

The promotion of sustainable cropping systems, including crop mixes and improved genetic strains, can significantly reduce deforestation for agricultural expansion. Furthermore, non-farm activities such as cottage industries should be introduced, supported by incentives for voluntary relocation measures.

It is evident that a holistic approach is required to address the complex interplay of resource availability, climate change, and population growth. The study's findings provide a critical foundation for future policies and actions aimed at fostering sustainable livelihoods in these communities.

## Trailblazing CRM and Media Specialist: Dennis Maina's Journey of Innovation with Suss



*Dennis Maina, Techpreneur*

**1. Can you tell us about your journey and how you became a CRM and Media Specialist?**

Dennis embarked on his career journey, at the tender age of 24 as a Digital Marketer at SportPesa where he piqued his interest in the digital world.

He transitioned to working for Africa's leading agency; WPP Scanad where he was appointed as the Regional Digital manager handling Africa's digital assets.

**2. What inspired the creation of Suss, and how would you describe its mission and role in serving the world's best-loved brands?**

The growing importance of Digital Marketing and the identification of various gaps while working with marketing agencies led to the birth of Suss; a marketing technology platform for the African market.

At Suss Ads, our mission is to be a cutting-edge technology centre of innovation without limits, where we leverage our digital capabilities and pan-African intelligence to provide unparalleled service to our clients. By delivering exceptional customer experiences and providing actionable insights, we strive to be the go-to partner for businesses looking to achieve marketing excellence in the digital age. Our customized solutions are built on three core pillars: Media Exposure, Performance Marketing, and Tools & Technology.

-We Engage with your audience at the optimal time and in the appropriate ad location. Our inventory ensures exposure in relevant areas, and with the proper messaging, it can significantly increase brand awareness and conversion rates, leading to improved business metrics.

-Our team of developers and technology tools, such as the WhatsApp bot, Onsite Messages, and App and Web Push notifications, work closely with clients to facilitate integration and help achieve their objectives.

**3. Can you explain how Suss leverages digital capabilities and Pan African Business Intelligence to benefit your clients?**

Suss Ads is heavy on data-driven metrics where we use digital analytics tools to track and analyse the performance of marketing campaigns.

This data informs our decisions in understanding consumer behaviour, market trends, and competitive landscapes to optimize strategies in real-time and offer the best marketing technology solutions to our clients.

**4. What opportunities has Suss provided to young talents across Africa?**

- Internship programs - We offer mentorship opportunities and hands-on experience to students by guiding and helping them explore their skills related to the field of marketing.
- Training - We conduct sessions to train young talents on digital marketing content creation by industry experts who share their insights, and knowledge in marketing and creative projects.
- Access to tools and resources- We provide access to marketing tools for educational purposes that may be hard to maintain for individual talents.
- Career development programs- We offer work opportunities that focus on long-term career development, leadership training, career guidance, and continuous learning opportunities within the agency.

**5. In your opinion, what are the key trends and challenges in the world of market research and digital communications today, and how is Suss addressing them?**

Advanced Analytics and Artificial Intelligence- To enhance the overall customer experience, we have tools, technology, and a team of developers who work and walk with clients to facilitate integration that boost businesses to realize their objectives.

Innovative products like WhatsApp Bot, onsite messages, and App and Web push notifications.

Data Security and Privacy- Suss Digital prioritizes compliance with data protection regulations when collecting and using consumer data considering our decisions and marketing strategies are mostly data-driven.

Measuring the Return on Investment (ROI) of digital communication efforts can be challenging hence we set clear key performance indicators with our clients to assess the success of their marketing initiatives.

**6. Can you share any future or exciting developments that Suss has in store for its clients and the industry?**

We are developing the Suss ecosystem to provide businesses with access to marketing technologies that can help them connect with their target audience. This includes Suss Ads, Suss SMS, Suss Pay, and SussDMP.

**7. Lastly, could you offer any insights or lessons learned from your journey that you believe would be valuable for our ATPS newsletter readers?**

The marketing journey involves continuous learning, adaptation, and evolution.

Success in marketing is deeply tied to understanding and building strong relationships with your audience where a brand needs to prioritize audience research and continually listen to feedback. Tailor your messaging, content, and campaigns to address the needs and preferences of your target audience, invest in analytics tools and regularly analyse data to measure the impact of your marketing efforts.

Incorporating these insights and much more in your brand will contribute to long term success, a strong and memorable identity for generations.

# Africa Climate Summit/ Africa Climate Week 2023

The Africa Climate Summit and Africa Climate Week 2023, which took place in Nairobi, Kenya from September 4th to 8th, gathered leaders from across the continent to address the pressing issue of climate change and its effects on Africa.

At the event, the ATPS team actively participated in key sessions, including the launch of ClimDev-Africa Phase II, a collaborative effort by the United Nations Economic Commission for Africa (ECA), the African Union Commission (AUC), and the African Development Bank (AfDB).

For ATPS, this session held special importance as we are recipients of funding from the Africa Development Bank for our project, 'Building the Capacity of Selected sub-Sahara African Countries to Effectively Measure Progress in their Nationally Determined Contributions' Implementation Using Tracking Tools and Indexes.'

In 2019, ATPS and our partners embarked on a pioneering journey, resulting in the development and pilot of an NDC (Nationally Determined Contributions) implementation monitoring, tracking tools, and index. This innovative approach allows us to assess NDC progress across five critical components, enabling policy decisions and fostering healthy competition among countries and regions to enhance compliance. Our ongoing project will leverage these valuable insights and tools to empower focal persons and champions in twelve selected sub-Saharan African countries to effectively measure their NDC implementation progress.



*(From far left) ATPS Programme Manager, Mr. Alfred Nyambane, Rita Effah, Africa Climate Change Fund (ACCF) Coordinator,  Ms. Margaret Barihaihi, Regional Manager, Anglophone- Africaone and AfDB, Dr. Helene Gichenje, in a panel discussion at Africa Climate Week Side Event: Africa's NDC Implementation and Ambition Gaps, on 7th September, 2023.*

## ATPS' AI Training Draws Participants from Across Africa

In a pivotal moment for African agriculture and technology, the African Technology Policy Studies Network (ATPS), in collaboration with the International Centre of Insect Physiology and Ecology (ICIPE) and Kumasi Hive, with support from AI4D Africa, recently conducted a groundbreaking training program on Product Development and Commercialization of AI Technology in Agriculture and Food Systems. Held from September 14 to 15, 2023, this training event brought together participants from East, West, and Central Africa to delve into the promising intersection of AI and agriculture.

The training covered a range of critical topics, including AI product design considerations, strategies for moving products to markets, market engagement strategies, and the intricacies of product commercialization. These subjects were carefully crafted to equip participants with the knowledge and skills required to leverage AI effectively in agriculture.

One of the highlights of this training was the opportunity for participants to network with industry leaders and experts in the field. Such interactions are invaluable as they facilitate knowledge exchange and pave the way for potential collaborations that can drive innovation and growth in the agricultural sector.

As Africa continues its journey toward agricultural transformation, it is initiatives like these that will serve as catalysts for change. The partnership between ATPS, ICIPE, Kumasi Hive, and the support from AI4D Africa has paved the way for a brighter, technology-driven future for African agriculture.

## Meet Our New Staff

*Susan Aquila Mburu,
Communication & Outreach Officer*

Susan Aquila Mburu, a dynamic Communication Specialist, brings a wealth of expertise that spans the vibrant spectrum of communication. Susan's impressive journey in the realm of communication has seen her contribute significantly to renowned organizations. She made her mark at Nation Media Group's TV powerhouse, NTV, where she served as a Television Producer. Her creative talents further flourished during her tenure as a Video Content Officer at Jomo Kenyatta University of Agriculture & Technology.

Before joining the ATPS family, Susan served as the Communication Officer for the Africa SLCP Project, a groundbreaking initiative supported by the ClimateWorks Foundation. Her experiences in these organizations have honed her skills and enriched her perspective.

Susan's educational journey is fortified with a Bachelor of Arts in Communication from Daystar University, an MBA from the University of South Wales, and a Master's degree in Digital Marketing and Business from MBS.

Beyond her academic achievements and professional milestones, Susan proudly aligns herself with prestigious organizations, including the Association of Media Women in Kenya (AMWIK), Women in Film & Television, and the Media Association of Kenya.

Doreen is an exceptional Certified Public Accountant of Kenya (CPA-K), proudly registered with ICPAK. Armed with a Bachelor of Commerce degree in Finance, she boasts over five years of dynamic and continually enriching experience in the realms of accounting, finance, and administration. Doreen is not just a critical thinker; she's a financial maestro who thrives both as an accomplished individual and a dedicated team player.

*Miss. Doreen Ongoro, Finance & Admin Assistant*

# National Chapter News

## *National Determined Contributions (NDCs) Project*

The 'Building the Capacity of Selected Sub-Saharan African Countries to Effectively Measure Progress in their Nationally Determined Contributions' Implementation Using Tracking Tools and Indexes project is making significant strides, gaining momentum as we move forward. Following the completion of Stakeholder Mapping and Analysis Reporting, our ATPS National Chapters in Namibia, Nigeria, Sierra Leone, Uganda, and Zimbabwe have successfully concluded their Key Informant Interviews and Focus Group Discussions.

The upcoming phase of the project will focus on the development of a training manual for Trainers of Trainers. We extend our heartfelt gratitude to the African Development Bank Group (AfDB), our dedicated chapter coordinators, and all our stakeholders for their unwavering support throughout this endeavor.

For continuous updates on the project's progress, please stay tuned to our website and social media platforms. We are committed to keeping you informed every step of the way.

## *ATPS Sierra Leone Shines Bright in Media Spotlight*

Under the dynamic leadership of Dr. Kelleh Gbawuru Mansaray, the National Chapter Coordinator for ATPS Sierra Leone, the chapter has made impressive strides in showcasing the organization's initiatives and achievements. Their recent accomplishments were highlighted in the AVY Media Empire news bulletin on September 11th and 12th, 2023.

The spotlight focused on two critical projects: the National Determined Contributions (NDC) project, which addresses in-country implementation, and the Strengthening the National Research and Innovation Funding Agencies in West Africa (SRIFA) project.

This media recognition is a testament to the dedication and hard work of Dr. Mansaray and the entire ATPS Sierra Leone team. By actively participating in these projects and effectively communicating their impact, they have not only elevated the profile of ATPS but have also contributed to advancing research, innovation, and sustainable development in Sierra Leone.

The ATPS community applauds Dr. Mansaray and his team for their outstanding efforts and commitment to driving positive change in their country. Their success serves as an inspiring example of the meaningful impact that can be achieved through collaboration and dedication to ATPS's mission and objectives. Congratulations to ATPS Sierra Leone for shining the ATPS light brightly in Sierra Leone and beyond!

*Dr. Nicholas Ozor Chairing a Session during the 2023 Annual Conference of the Southern Voices Network for Peacebuilding (SVNP) on 12th September, 2023.*



*ATPS Executive Director Dr. Ozor and Guest Speaker Dr. Jakkie Cilliers who is the founder and former Executive Director of the ISS and currently the Chair of the ISS Board of Trustees on 12th September, 2023*



*Participants during an inception meeting with Shannon Sutton, the Gender Advisor at Gender at Work held on 23rd August, 2023*



*ATPS Research Officer Wentland, Programme Manager Alfred, and Dr. Christian Tegha during the Africa Climate Week 2023 in Nairobi Kenya on 5th September, 2023*



*ATPS team Research Officer Wentland, Programme Manager Alfred, and Communication and Outreach Officer Susan Mburu at the Africa Climate Week 2023 on 5th, September 2023*

*ATPS Sierra Leone National Chapter during the SRIFA Project Focus Group Discussion held on 12th September, 2023 at Fourah Bay College, University of Sierra Leone*



*ATPS Senegal National Chapter during the SRIFA Project Focus Group Discussion held on 12th September, 2023 at Goodrade Hotel*



*Participants in the Nigeria National Chapter Focus Group Discussion for the SRIFA Project on 5th September, 2023 at Rockview Hotel Classic*



*Participants in the Uganda National Chapter Focus Group Discussion for the NDCs Project on 30th August, 2023.*



*Participants in the Nigeria National Chapter Focus Group Discussion for the NDC Project on 16th August, 2023*



*Participants in the Namibia National Chapter Focus Group Discussion for the NDC Project on 29th August, 2023*

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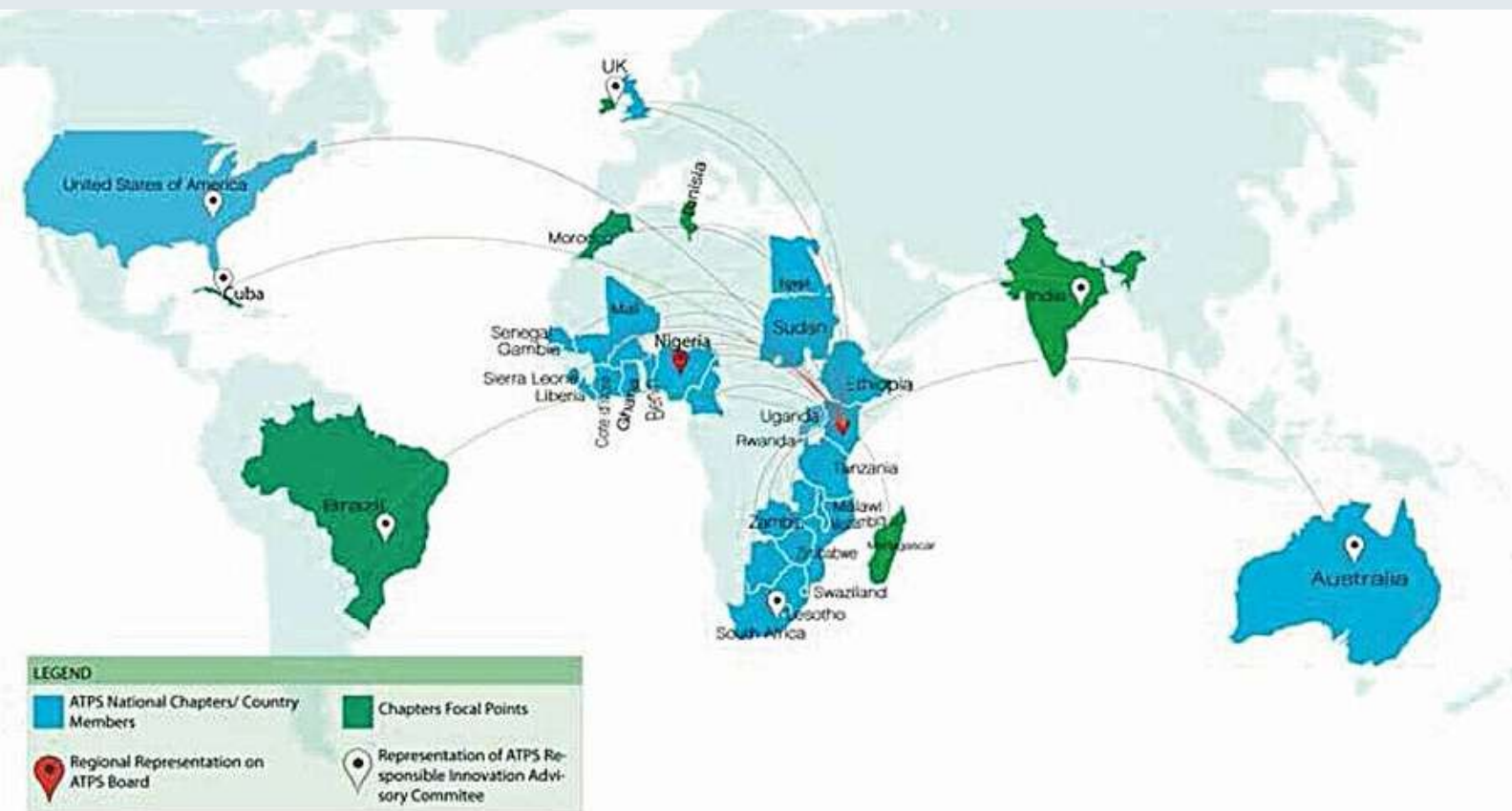
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- Chapters Focal Points
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