



# TECHNOPOLICY

## AFRICA

This is the official newsletter of the African Technology Policy Studies (ATPS) Network



**Hydropedalplane – One of a kind in the world**

**ATPS collaborates with AUC in STISA 2024 implementation**

**A spotlight on rural economics for STI development in Africa**

**ATPS Vision:**

To become the leading international centre of excellence and reference in science, technology and innovation systems research, training and capacity building, communication and sensitization, knowledge brokerage, policy advocacy and outreach in Africa

**ATPS Mission:**

To improve the quality of science, technology and innovation systems research and policy making in Africa by strengthening capacity for science and technology knowledge generation, communication and dissemination, use and mastery for sustainable development in Africa

**Overall Objective:**

To develop Africa’s STI capacity (knowledge basis & infrastructure, knowledge circulation & networks, knowledge conditions & policies) today for sustainable African development tomorrow

**ATPS Motto:**

Building Africa’s capabilities in science, technology and innovation policy research, policymaking and policy implementation for sustainable development

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## CHAIRMAN'S MESSAGE



*Prof. Shaukat Abdulrazak*

I am thrilled to present this final issue of –**Technopolicy Africa** 2015. The last quarter was a marathon for the ATPS team, as so much had been happening on the local, regional and global STI scene. The team burnt the midnight oil to ensure all the expectations of 2015 had been accomplished.

In this light, I want to warmly congratulate our Ag. Executive Director Dr. Nicholas Ozor; one, for the appointment as a member of the Governing Board of the International Research and Training Centre for Science and Technology Strategy (CISTRAT) Beijing, China. Second, for his recognition by the International Development Research Centre (IDRC) as an *African Climate Leader*. This derives from Dr Ozor's contributions to climate change adaptation and mitigation efforts on the continent. During the last quarter, Dr Ozor was also appointed a Member of the International Advisory Committee for the Global Bioeconomy Summit and participated in the global bioeconomy conference held from 24-26 November in Berlin, Germany. His dedication and zeal in promoting STI has been rewarded and we commend him for making the entire ATPS fraternity proud.

ATPS has been in support of the latest activities in the global arena especially on issues related to climate change which is one theme that ATPS is committed to in its mandate of building Africa's capabilities in science, technology and innovations for sustainable development on the continent.

In late September, world leaders adopted the 2030 Agenda for Sustainable Development, which comprises of 17 sustainable Development Goals (SDG's) to end poverty, fight inequality and injustice, and tackle climate change by 2030. Another major event is the just concluded Conference of Parties (COP

21) popularly known as 2015 Paris Climate Conference that brought together close to 50,000 participants with half of them drawn from government, intergovernmental organizations, UN agencies, NGO's and civil society. The COP 21 had an aim of coming up with an agreement of keeping global warming below 2°C. These two developments have been invaluable in promoting the achievement of a better and sustainable future for the coming generations. ATPS will continuously be committed in working towards these goals.

Our planet earth is facing a convergence of crisis: climate change induced extreme events, global financial crisis, deepening poverty and unemployment, energy and food insecurity, social inequities and political instability, and fast depleting natural assets. These exacerbate the challenge of sustainable development at all scales. There is growing consensus that new pathways to development are urgently required and the search for solutions needs to shift from the search for more financial resources to "growing smart". Transitioning from current to the desired growth pathways requires unprecedented systemic transformations in knowledge, technologies and innovation at all levels: from *institutional/governance innovations*, to *products/service innovations* up to *social innovations* that address the needs of the masses at the Bottom of the Pyramid. Bridging the chasms between public opinion, the scientific, technological, and innovation (STI) capabilities, and public policy required to deliver the transitions at the required speed and scale remains problematic. ATPS has recognized the anticipated damages that these challenges pose to human kind and the ecosystem as well and has remained focused in formulating strategies to address, reduce and possibly prevent them. The latest significant achievement being, the development of the *LandInfo* mobile application with our partners, which, is a technology solution, aimed at enhancing agricultural productivity and climate change resilience. The application is so far being up-scaled through capacity building of the users and is generating a number of partnership interests at the same time.

The ATPS will continue to implement its programs for the benefit of the continent so as to achieve sustainable development. On behalf of the ATPS Board, I specially want to thank our consortium of donors, partners and stakeholders who have relentlessly given us immense support in achieving our objectives in 2015. We seek for your continued funding supports during this second half of implementation of our Phase VII Strategic Plan 2013-2018.

**Prof. Shaukat Abdulrazak,**  
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 Chair, ATPS Board of Directors

## EXECUTIVE DIRECTOR'S MESSAGE



Dr. Nicholas Ozor

I am delighted to present the last issue of the 2015 **Technopolicy Africa** Newsletter. This issue marks the close of a successful and busy year that saw us progress to new and great heights. Administratively, ATPS focused on restructuring efforts that have seen new Board of Directors being appointed, new staff members being recruited and the continued re-branding process at various levels like the – **Technopolicy Africa** Newsletter.

Equally in the programmes, the last quarter was defined by a variety of significant activities outlined in the six strategic activities under the ATPS Phase VII Strategic Plan 2013-2018. In the continued efforts of building strong intra-Africa and global collaboration and partnerships, ATPS hosted a team from the Scientific, Technical, Research Commission (STRC) of the African Union Commission (AUC) led by the Executive Secretary Ahmed Hamdy for a 3 days working visit. During this period, discussions were held on how ATPS could assist the African Union Commission in the implementation of the Science, Technology and Innovation Strategy for Africa (STISA) 2024 agenda.

During the same period ATPS participated in a number of international conferences aimed at propelling our strategic activities in sharing of scientific knowledge, technologies, and innovations for sustainable development. One of the most significant efforts is in aggressively upscaling and out scaling the *LandInfo* mobile app, which is providing a solution in enhancing agricultural productivity and climate change resilience. The *LandInfo* app was presented to various stakeholders in several conferences and workshops. These include, African Forum for Agricultural Advisory Services (AFAAS) Extension Week and Regional Workshop and Conference on the use of Mobile Technology for Statistical Processes both in Addis Ababa. It was also presented during the Global Forum for Innovations in Agriculture (GFIA) 2015 in South Africa and the UNECA organized Volunteer Geographic Information workshop held in Nairobi among many others. These platforms were helpful in providing avenues to engage different actors with the new

mobile application and at the same time gain feedback that will be used in advancement of the application.

ATPS engaged in high-level deliberations on education, science, technology and innovation in Africa by partners and explored potential synergies and areas of future collaboration within the continental frameworks during the first specialized technical committee on education, science and technology. Further, ATPS presented a paper during the third meeting of the first session of Governing Board of International Research and Training Centre for Science and Technology Strategy (CISTRAT) in Beijing, China.

Together with STI experts from Africa and beyond, the ATPS led an expert panel session at the second AfricaLics international conference to address issues on science, technology and innovation (STI) for Africa's development. The conference, allowed the stakeholders to deliberate on the challenges facing African countries and the opportunities to promote innovation and inclusive development. Furthermore, ATPS participated in the 2015 sustainable development transition forum organized by the United Nations Office for Sustainable Development, which convened government officials, UN Agencies and experts from around the world. This was to discuss guidance on mainstreaming the 2030 Agenda for Sustainable Development and Sustainable Development Goals (SDGs) into national and sub-national development plans. Outcomes included raising public awareness on the SDGs and what is at stake, deepening multi-stakeholder approaches for planning and implementation among others.

Equally important, ATPS presented a paper at the 10<sup>th</sup> International Turkish- African congress. The event brought together various ministries and undersecretaries from Turkey, the African Union, expert institutions, Africa's prominent regional economic organizations e.t.c in Ankara, Dakar. In an endeavor to develop a robust Volunteer Geographic Information (VGI) mapping methodology for Africa, ATPS took part in the expert group meeting on VGI with prospects of facilitating the integration of community mapping into national mapping programmes across the continent. In addition, in line with the SDG's, ATPS participated in the summit which focused on the post 2015 development goals and aimed at starting a multilateral agenda setting process. For this reason, I want to thank the ATPS Board, National coordinators in all the 30 chapters, secretariat staff, and the entire network members and stakeholders for the enormous support and guidance received in 2015. We look forward to continued cooperation in 2016 and beyond.

I am sincerely grateful to our numerous donors who have supported our work during the year 2015. They include; the United States Department for Agriculture Agricultural Research Service (USDA-ARS); Technical Centre for Agriculture (CTA); the African Development Bank (AfDB); Global Alliance for Livestock Veterinary Medicines (GALVmed); JRS Biodiversity Foundation; Ministry of Agriculture, Kenya - AFFA (Fiber Crops Directorate); African Climate Change Fellowship Program (ACCFP); and the Association of African Universities (AAU). We remain committed to delivering world-class services and outputs in all our program implementations and equally ensure value for money. We therefore use this opportunity to solicit for more funding supports from other donors to enable us meet the expectations of our stakeholders (policymakers, researchers, private sector actors and the civil society) in building Africa's capabilities in STI policy research, policymaking and policy implementation for sustainable development on the continent.

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

## ATPS WORKING SESSION WITH STRC OF THE AFRICAN UNION COMMISSION



*ATPS Executive Director, Dr. Nicholas Ozor shakes hands with Dr. Ahmed Hamdy the Executive Secretary of Scientific, Technical and Research Commission (STRC) of the African Union Commission (AUC), during a three-day working visit at the ATPS Secretariat Offices.*

### By Dorothy Njagi

ATPS hosted the Scientific, Technical and Research Commission (STRC) of the African Union Commission (AUC), during a three day working visit at the ATPS Secretariat Offices. The Executive Secretary Dr. Ahmed Hamdy led the STRC team while the Executive Director Dr. Nicholas Ozor led the ATPS team.

The working visit agenda was to comprehensively discuss the science, technology and innovation strategy for Africa (STISA) 2024, STRC and ATPS programmes and projects and areas of common interest and cooperation. This is in line with ATPS's strategic priority area on Intra-Africa and Global Collaboration and Partnership (IGCP) that is aimed at developing new forms of intra-Africa and global partnerships within and amongst stakeholders for achieving Sustainable Development Goals (SDG's) in Africa.

The STRC is an institution within the African Union Commission, which promotes the role of science, technology and research, in the strengthening of integration, cooperation and development of the African Union Member States. The STRC is mandated to develop policies and strategies that respond to Africa's development challenges like poverty, conflict, diseases, unemployment, population growth, and climate change. This is guided by the STISA-2024 and the former consolidated plan of action (CPA). It's activities are implemented through different programmes that include Pan-African Intellectual property organization, AU project on infectious diseases, framework for capacity building of Journalists in reporting science and technology, strengthening and building African capacity on Geographical Indicators (GIs) and development of the African strategy for documenting and protecting of traditional and indigenous knowledge.

On the other hand, STISA is a strategy designed to respond to the needs of transforming Africa into a knowledge-based and innovation-led society. Guided by the AU vision "An integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in global arena", STISA takes into account priorities identified for the continent, and contained in various AU sectoral frameworks. The priority action areas include, eradication of hunger and achieving food security, prevention and control of diseases, protection of our space,

communication both physical and intellectual mobility, living together to build our society and wealth creation. STISA was adopted in June 2014 during the 23rd ordinary Session of African Union Heads of State and Government Summit. The 10 years strategy is part of the long-term AU Agenda 2063 which is underpinned by science, technology and innovation as multi-function tools and enablers for achieving continental development goals.

During the working visit, ATPS and STRC teams identified areas of common interest and collaboration and came up with mutually beneficial thematic areas of work for joint implementation. These include but not limited to: Low Carbon Development and Green Economy; Inclusive Innovation; Policy on STISA 2024, Communications and Outreach; STI for Youth and Women Empowerment; Linking Agriculture and Nutrition for Improved Health Outcomes (Nourishing Africa); Diaspora Audit and Engagement for Africa's Development (Aimed at Ensuring Brain Circulation); Capacity Building of Extension Agents, Farmers, and Land Use Planners (Technical Advisers) on the Use of LandPKS Mobile Technology for Agricultural Productivity and Building Resilience to Climate Change; and Building competencies of African Professionals to Implement the Sustainable Development Goals (SDGs).

Capacity building, climate change, youth and women empowerment, food and nutrition security, and policy development and advocacy constitute a cross-cutting objective. Capacity building will focus on extension agents, farmers land use planners (technical advisers), on the use of LandInfo mobile App technology for agricultural production and building resilience to climate change. Other areas of focus will be science, technology and innovations (STI) policy formulation and implementation for sustainable development, approaches to effective policy influence, science communication, entrepreneurship skills for scientists among others.

Climate change is also a key area of collaboration since both organizations are committed to creating climate change resilience programmes and building climate change gaps and development of technologies for adaptation to climate change in Africa. Another area that cannot be overlooked in development issues in Africa is the empowerment of youth and women which focuses on STI for post conflict recovery in Africa; integrating young arms to their society, building entrepreneurship skills of youth in Africa, strengthening Africa youth and women forum for STI.

In addition, policy development and advocacy is also critical for accelerating pro-poor low carbon energy development, linking agriculture and nutrition for improved health outcome in Africa, fostering social innovation for sustainable development in Africa, African union policy on inclusive innovation and Diaspora audit and engagement for Africa development and brain circulation.

ATPS and STRC hope to work towards the achievement of economic growth and human development through STI as they share a number of priority areas in common. This is because, it is imperative to invest in science, technology and innovations for sustained socio-economic development on the continent.

## HYDROPEDALPLANE INVENTION – ONE OF A KIND IN THE WORLD



Eng. Lebanon Muchuma (Photo: Dorothy Njagi)

Inventions can revolutionize how we operate and live our lives making it easy, greatly helping in solving problems, and in decision-making as well. This is more likely to happen if the inventions are new and have a relation between the usefulness of the invention to the community and the level of effort required to make it work. The different levels of trainings and interests of inventors also play critical roles on how the inventions appear and function. Mr. Thaddaeus Lebanon is one inventor from Kenya who has decided to 'walk the talk' in the science and technology world of innovations by developing the first ever hydropedalplane device.

The hydropedalplane is a high speed cycling means on water that is environmentally friendly since it uses no engine, thus will help in reducing carbon emission in water, reduce pollution and eventually contribute in mitigating climate change. The Overboard Drive Mechanism relates to propulsion and maneuverability of boats on water. The Hydropedalplane has motion transmission system below the floor of the boat where the propeller also operates under the boat and that there exists a continuing need for new Overboard Drive Mechanism which can be used for transmitting motion from cycling means, solar system and air-cooled engine to the propeller.

This invention essentially comprises Overboard gearbox, aero gearbox or submersible gearbox, which are linked together with a vertical link pipe. The Overboard gearbox has a pulley,

which picks the motion from the power source horizontally, via sprockets, chain, shafts, gears, and convert the motion vertically and back to horizontal movement, to the propeller and a thrust force is produced to propel the boat forward.

The link pipe is designed to rotate in the overboard gearbox and is connected to the steering box by wire ropes, the chain and the sprocket. This makes it easier for the operator to turn the submersible gearbox/rudder and give a desired direction to the boat.

The device is also designed to pick the motion from the power source and convert it vertically upward to rotate the propeller in the air and give a forward thrust to the boat. The device, when the link pipe is fitted with a large spur gear, can enable the operator to rotate the submersible gearbox/rudder 360 degrees which makes it possible to reverse the boat without engaging a reverse gear making it suitable for global water cycling sports.

This invention can also be used to conserve our environment especially on vessels cleaning the lake for example water hyacinth on Lake Victoria in East Africa. The device is designed to rotate the subversive gearbox 360 degrees using only a steering wheel.

In February 2015, the World Intellectual Property Organization

(WIPO) published it making it the latest bibliographic data on file in the International Bureau. The hydropedalplane has already been tested in Kenya and is set to place the country in the global map as the first Naval and Aeronautical Science Research project to be undertaken by a Kenyan since independence.

Thaddaeus Lebanon is also in the process of developing a cycling Aircraft that will be used for leisure and air sporting that will enable man to fly manually. "Scientists and Engineers have held the assumption and concluded that man will never fly manually but I will overcome this," said Thaddeus.

## Dorothy Njagi's Interview with the inventor Eng. Lebanon Muchuma

### What motivated you to come up with this idea?

This idea was motivated by the desire to develop a high speed, manually propelled boat that will help in mitigating climate change which has become a global catastrophe. The other reason is to enable me to get global recognition as an inventor who contributed to impacting people's lives positively. In the annals of Naval science history, there is no invention of this kind on the planet, thus I will be contented to be the first man to develop it.

### What are some of these impacts that you foresee that will be generated by use of this invention?

The Hydropedalplane will enable man to transverse waterways by way of cycling and propelling the boat at high speed. It will also help in conserving our marine ecosystem since it is environmentally friendly as it uses no engine which can produce smoke, noise or discharge oil in water either by design or by accident. Economically, it would foster trade links between coastal and lake regions communities by way of facilitating marine transport of people and goods as well as be a source of income. It will also promote tourism by providing additional marine sporting activities, which will help create employment opportunities for the youth. The Unique water cycling sport is in the near future going to be adopted in Commonwealth and Olympic games. Further, it will foster marine engineering and general water vessel technology transfer and facilitate the exploitation of the potentially navigable lakes, rivers and the east coast. It will also help in enhancing security measures in water as it can be used in rescue operations during floods. Massive job creation will be experienced globally as the Invention is going to revolutionize small craft activities in the sector of Maritime globally.

### Which areas can the invention be used?

It can be used globally in rivers, lakes, dams, floods, seas and oceans. In Kenya the Invention can be used in the Lakes like: Turkana, Victoria, Baringo, Bogoria, Elementaita, Naivasha Nkonga and Chala. Rivers Tana, Athi Sabaki and Nzoa. It can also be used in Dams and during Floods. This would then be transferred to the entire East Africa, Africa region and the entire world.

### What makes it unique from other boats?

The technology it uses is unique as it uses overboard drive mechanism that makes it possible to rotate the propeller in water or in air, to create a thrust force and propel the boat forward. The system also has overboard gearbox and submersible gear box that turns in the overboard gear box to give the boat the direction. The device is portable and easy to fit and remove from the boat. The device which has now replaced an overboard engine generates the speed almost at the same speed of the engine. The Invention also replaces the boat rowing of many people. The overboard drive mechanism is also designed for single cycling and double cycling system, and can be used for fishing, water sporting, transport, rescue, and patrol.

### What is the speed of the Hydropedalplane?

Initially during the first testing, it achieved 5kms/hr, but at present it can speed at 30kms/hr and over, faster than traditional boats.

### How long did it take to produce the first boat?

The first one took me about 1 1/2 years.

### What is your education and professional background?

I have education qualifications in industrial electronics and Structural and ship building qualifications from London in UK and Lindau, Biberach in Germany respectively. I have also worked with National Cereals and Produce Board (NCPB) for sixteen years and currently with Ninon Engineering.

### What challenges did you face in developing the Hydropedalplane?

I had a major challenge of labour since no one has been trained in naval architecture and marine engineering here in Kenya thus I have been the major team player in technological expertise. The other challenge was with the funds as I had to source for funding from the National Commission for Science, Technology and Innovation (NACOSTI) which got exhausted along the way.

### Have you been recognized or received any awards locally?

Yes, I have received the best innovator award from the National Commission for Science, Technology and Innovation (NACOSTI) in May 2010 and the best designer by the Ministry of Industrialization on the 26th April 2011 during the Ministry's celebration of the World Intellectual Property Organization (WIPO) day.

### What do you anticipate to achieve in the next 5 years with this invention?

I am hopeful that in five years' time my invention will be produced in mass globally and will be adopted for use in Commonwealth and Olympic games. Thus, I am also optimistic that the first trial can be done during the 2020 Olympic games. In Kenya and East Africa Community, my invention will be everywhere in navigable waters. This is possible through political goodwill of our Government whose people are the beneficiaries of the Invention.

## A SPOTLIGHT ON RURAL ECONOMICS FOR STI DEVELOPMENT IN AFRICA



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**By Dorothy Njagi**

In the current global economy a lot of focus is usually laid on urban economics with more emphasis on location of households and firms such as the real estate, education, public transit, electricity, telecommunications and other information, communication technologies (ICTs). The media tends to publicize these areas and since their role involves agenda setting, this translates to what people will talk about and as a result contributes to shaping business ideas and interests.

What is discouraging is that most African countries depend on rural economics, which is dominated by agriculture for food, and livelihoods. Poverty is predominant in the rural areas yet very little is stressed about these areas. The focus on rural economics for STI development was one of the key agendas for discussion by experts during the AfricaLics conference in Rwanda on 17-19 November 2015.

The world today is greatly becoming competitive with global economic prospects set to determine the development trends. In this regard, the importance of science, technology and innovation cannot be overemphasized especially for the developing countries that are looking forward to great progress in the near future. This significance can well be illustrated by the example of the development disparity of Ghana and South Korea where both countries had an equal per capita income at independence in 1957. South Korea's great transformation started with an agrarian reform and later transitioning to industrialization with a focus on manufacture of steel and automotives.

STI is undoubtedly the solution to attaining environmental sustainability, reducing poverty and wealth creation. What remains a paradox is the fact that Africa is rich in natural resources, African heritage and culture, indigenous knowledge, mineral wealth yet faced with numerous challenges of conflicts, insecurity, inequalities, poor governance, corruption, increase in population growth, diseases, low investment levels in science and technology among others.

In the midst of all this, it is remarkable that many African countries are actively starting to move away from the negative branding by recognizing the need for expanding their ICT sector for development. Kenya for example is keen on developing its ICT and has recently recorded substantial development with a projected growth of beyond 15 percent by the end of this year compared to the 13.4 percent last year. Similar progress has been recorded in Rwanda where the country's national development is pegged on ICT investments. Notable enough

is that the country was among the first countries in Africa to launch 4G technologies on a commercial basis and has the highest Internet user growth rates.

More significant among selected African countries progress was the launch of smart Africa manifesto in 2013 that aims at placing ICT at the centre of the signatory countries socio-economic transformation. These countries include; Burkina Faso, Gabon, Mali, Senegal, South Sudan, Chad, Uganda, Kenya and Rwanda. There are treaties like Lagos Plan of Action (LPA) of April 1980, and the Science, Technology and Innovation Strategy of Africa (STISA) 2024 that have an objective of transforming the potential of ICT for sustainable development.

The slow progress in Africa's ICT development can be attributed to the short-term view to human development and over reliance on aid and financial support, which comes with conditions and at times, are based on short-term activities and solutions. More to it, there are weak institutions managing the aid and there are not accountable to the people thus compromising on the transparency and sustainability of this financial support.

As a result, this has made Africa to lag behind in terms of ICT, indicators like gross expenditure on research and development (GERD), which can help us in measuring and confirming this as a percentage of GDP, percentage of research publications, percentage of world patent, internet user per 100, and number of researchers per million. Evidently, Africa accounted for about 0.9% of the world's gross expenditure on research and development in 2010 compared to Asia with 30.5% and Europe 27.2%.

It is therefore critical for the players in the science technology and innovation arena to remain focused in coming up with strategies that will ensure investments in ICT achieve a STI-led development model in Africa. Government policies need to refocus on ICT development and meet needs of the people. With adverse challenges facing Africa like the rapid population growth and climate change atrocities, counter strategies have to be established with all efforts aligned to the promotion of rural economics. We can then be optimistic that rural economics will have a better place to thrive putting into consideration that the Gross Domestic Product (GDP) of most African countries heavily depend on climate sensitive activities like agriculture, livestock and fisheries, mining among others.

The media on the other hand needs to highlight the opportunities in rural economics as much as they do with urban economics, as this will create interest in people especially the youth who often move to cities to seek for jobs leaving behind huge chunks of unexploited land. With the youth focus shifting to rural economy and use of technologies for agricultural productivity then Africa can boost its production and create jobs, enhance food security and social political stability.

Integrated approaches like combining agriculture with industrial services and partnerships among public and private sectors, can however not be overlooked as they will promote new opportunities and innovations in ICT enhancing rural transformation. Rural economies need to be the focus of local, regional and global development agendas for sustainable African development.



## CAPACITY BUILDING ON THE USE OF AGRICULTURAL INNOVATIONS



Field demonstrations of LandInfo Mobile Application use by ATPS in Kabarnet

**By Ernest Acheampong,  
Dorothy Njagi and  
Nicholas Ozor**

Technology has become the latest solution in enhancing agricultural productivity and enhancing climate change resilience. The increasingly complex challenges of urbanization, rapid population growth, land degradation and climate change that have had adverse impacts on agricultural land in Africa have prompted various stakeholders to reconsider current land use systems, and formulate innovative measures that optimize agricultural and sustainable land management practices.

Fortunately, advances in technological application are creating the way for the development of new innovative tools for inventory, assessment and monitoring, sustainable land use planning, and connecting people across the globe. Many innovations in technology have been developed to provide various solutions in agriculture and many have been localized to suit the indigenous farmer's requirement. They are providing platforms for agricultural value chain actors to increase efficiencies and improve agricultural processes while others are guiding farmers in increasing their production level based on local conditions. Further, there are innovations that are delivering efficient systems of capturing farm based data without the need of heavy capital investment of buying data collection phones for farmers. Others are able to expand access to credit to the less privileged smallholder farmers by providing modern tech-driven credit assessment tools.

With all these innovations, it is critical to build the capacity of the farmers, extension workers, opinion leaders, technical advisors and other users so that they can appreciate and find value in the applications. The ATPS with its partners has pioneered a mobile application LandInfo that allows individuals and organizations to use a smart phone to determine land

potential at a point specific location based on local and global knowledge and information about the potential of similar types of land.

This app allows users to enter data about soil texture, topography and easily observable soil properties. It also provides free cloud storage and sharing, which means that you and others can access your data from any computer as soon as your upload completes. Cloud connectivity also allows the app to return site-specific climate data such as temperature and rainfall, estimated amount of water the soil can store for plants, and growing season length information for your location within about 5 minutes of data upload. This is part of a suite of Android applications released in April 2015 to serve as site characterization tools for use by land managers. Design modifications are ongoing, and are implemented based on user feedback.

In this light, ATPS has aggressively trained extensions workers in partnership with Fiber Crop Directorate of the Kenya's Agriculture, Fisheries and Food Authority (AFFA) on how to use the application. The trainings have so far been carried out in Kisumu and Baringo Counties. The training approach was participatory combining both interactive and field demonstration to engage participants in order to attain absolute exposition of the LandPKS components, functions and application on the field.

These trainings have enabled the extension workers to have a very good enlightenment about both the theoretical insights that informs the LandInfo app as well as gain practical experience. Participants are also taken through a step-by-step guide into the app, its functions and application. At the end of the trainings the impact is evident as participants have a deepened understanding and knowledge about the application's operations. Additionally, participants get the opportunity to broaden options with regards to decisions on interventions and management of agricultural lands. The key achievement especially for LandInfo, which is a new application, is to get the valuable feedback that informs the future development of the application.

After the trainings, follow-ups should be done to assess the level of adoption considering the challenges that the extension workers could be facing in using the application so as to formulate solutions to counter them. As agriculture faces a threat in the future the need for Information Communication Technologies (ICTs) cannot be overlooked more so in Africa where many countries rely mainly on agro based economies. Farmers need to be empowered by use of technological equipment so as to encourage good land management practices and ensure food security is greatly achieved in Africa. However, even with these innovations their adoption by users needs to be underscored so as to leap the expected benefits.

## UNVEILING THE HIDDEN WEALTH IN NIGERIA'S SCIENCE AND TECHNOLOGY SECTOR



**By Yusuff Utieyineshola Adeleke, Senior Research Officer, National Centre for Technology Management (NACETEM), Nigeria**

Over the years, Nigeria has attracted so many appellations among other African countries from “Giant of Africa” to “Africa’s largest economy” and more after rebasing of its GDP in 2014. Ironically, when it comes to using this huge potentials to really dominate the continent in terms of development, particularly in relation to other African countries like South Africa, Ghana, Kenya, Botswana, etc., there seems to be a disconnect. The reason is not far-fetched as the very main resource potentials are given less priority hence bane of the under-development.

Across the world, no nation has ever made its mark in the comity of nations without prioritizing its budgetary allocation to Research and Development (R&D), particularly in the Science and Technology sector. In 2012, China’s total spending on R&D was one (1) trillion yuan (\$ 164 Billion) which translates to about 2% of its gross domestic product (GDP). The same year, the U.S spent \$447 Billion, or 2.8% of its GDP for this same purpose. It is noteworthy that while China’s economy has continued to grow rapidly, so does its R&D spending, and it is projected to overtake that of the United States by 2022. Notably, in 2011, 51.7% of China’s economic growth was attributed to its scientific advances. While still believing that technical innovations will help it address many of its challenges, including the need to upgrade its industrial base, reduce air pollution, and address growth inequalities.

Nigeria, just like China, has the potential to take a lead in fast-tracking its micro and macro-economic development, reduce poverty, unemployment, only if S&T is mainstreamed. Statistics show that in 2012, the percentage budgetary allocation to S&T Ministry in Nigeria was about 0.64% as against the 2% case of China. Unfortunately, this allocation has continued to drop considering, it was in 2007 that the sector got about 1.04% allocation. In reality, Nigeria cannot record any tangible development with this allocation. It is important to realize that no nation can attain meaningful development if S&T is not given adequate attention and support. This is because S&T is the bedrock upon which all other sectors of the economy must be built upon.

In the immediate past administration in Nigeria, priorities were placed on other Ministries such as Petroleum Resources,

Health, Agriculture, Power, etc at the expense of S&T Ministry, without much contribution to inclusive growth of the country. It is not that these ministries are of less importance, but the point is that they all need to be driven by knowledge emanating from S&T Ministry. During the previous administration, little attention was given to this sector. In most of the foreign trips embarked upon by the last administration where bilateral agreements were signed, Minister of S&T was always excluded from the entourage, which mostly attracts the same set of other Ministers as part of the entourage. In this light, will any country sign any form of agreement with another country such as China, India, Brazil, and Israel without having any key representatives from S&T like the Minister (S&T) as a member?

With the recent appointment of Mr. Ogbonnaya Onu as the Minister of S&T by President Mohammadu Buhari, there seems to be an avalanche of optimism for a virile S&T sector capable of fast-tracking the desired contribution of knowledge and innovations that will project Nigeria to an unmatched zenith of economic pedestal. Consequently, for the Minister to unveil the hidden wealth in Nigeria’s S&T sector, he must, advocate for recognition of the S&T Ministry by the three tiers of government, increase the budgetary allocations and fund release to R&D institutions as well as prioritise the researches efforts that are capable of addressing those peculiar challenges in the Nigerian society today.

Further, there has to be full implementation of the recently launched Science, Technology and Innovation (STI) Policy by establishing National Research and Innovation Fund (NRIF) while ensuring the National Research and Innovation Council (NRIC) that was constituted in 2014 is functional. All Agencies and Parastatals under the Federal Ministry of Science and Technology (FMST) should engage with each other in collaborative research.

In addition, it is important to define where there is duplication of function among the agencies while encouraging overlap; this will set these agencies as partners rather than competitors, which has always been the case. Importantly, promotion of the use of locally produced technologies and scientific innovations should be encouraged so as to adapt the “situation-solution model for commercializing R&D output in Nigeria” as proposed in one of the research papers titled “Strategic Approach to R&D commercialization in Nigeria”.

## GENDER IN EXTENSION APPROACHES



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**By Ann Kingiri**

Extension services are fundamental for sharing new knowledge generated from research with farmers for the benefit of agricultural productivity, increasing food security and improving rural livelihoods. If done effectively, this farmer education support can enable them to optimize the use of limited resources, overcome new agricultural challenges and work as a driver of pro-poor economic growth. Gender differentials in extension services cannot be ignored, as they are common in many rural areas in Kenya. In addition, women's role in extension services cannot be predetermined, despite their important role in agricultural production, however disparities exist in the delivery of advisory services and training programmes. Women contribute a lot in food production and they have a better capacity of taking up modern technologies and information than men. Regrettably, agricultural extension approaches in Kenya are gender-blind hence the reason for the big gap between policy and practice unless the social-cultural and social-economic differences are put into consideration.

Against the backdrop of international and regional human rights obligations, Kenya recognizes that enhancing gender equity in the agricultural sector and mainstreaming gender will help the country to fulfill its commitments at both global and national levels guided by the constitutional provisions which in return will enhance economic growth.

Historically, agricultural advisory services were being delivered only through the Ministry of Agriculture as a means of disseminating information and helping farmers use their resources in increasing productivity. In recent times, there are more actors in this field including church based organizations, non-governmental organizations, cooperative societies among others. These organizations support farmers with more services that help them transition from subsistence to commercial farming through the use of new technologies as well as connecting farmers to other players in the agricultural value chain.

This notwithstanding, the gender roles in extension services in Kenya are still facing constraints. Cultural definitions of the role of women tend to place women in household related chores while men are responsible for production related activities. Thus, women get the perception that they are weaker and as a result this creates the gender bias in extension related services and activities. Traditional beliefs like witchcraft also contribute to cultural practices; again, the superior nature of men as decision makers especially in control over land makes them advantaged in accessing farm inputs and valuable information. The number of extension workers compared to number of women farmers is low which is a technical challenge.

The lack of gender responsive indicators to assist in monitoring and evaluation and measuring impact also contributes to the gender disparity. Further, introduction of low level technologies that are not gender friendly and do not consider factors that impact their usage and the failure of the public to embrace gender parity in agriculture are other factors.

It is notable that, there are some approaches that favour women including ICT, common interest groups, demonstrations, courses for farmers with some tailor-made for women and use of women mentors in extension. Subsequently, gathering gender-disaggregated data is necessary to guarantee the same benefits for both men and women farmers. The gender mainstreaming endeavors must be informed by a careful analysis of the role of relevant ministries and consequently development of gender sensitive indicators aligned to these goals.

There is also need to build the capacity of extension officers so as to help them embrace gender extension services. Therefore, an engendered extension package must be made more relevant to the context in which agricultural extension takes place e.g. relevant to the crops grown and farming systems. Lastly, it is paramount to incorporate gender and sociological perspective in the framework of agricultural extension programming.

# OPPORTUNITIES

## VACANCY ANNOUNCEMENT AT ATPS

### **FINANCE AND ADMINISTRATIVE OFFICER**

The African Technology Policy Studies Network (ATPS) is seeking to recruit a dynamic trans-disciplinary individual to fill the position of Finance and Administration Officer. Reporting to the Executive Director, he/she will be responsible for overseeing or undertaking all financial/accounting and administrative functions in ATPS pertaining to office and project administration.

Major responsibilities include:

#### **A. Finance**

- Authorize all payments and approve financial registers.
- Review financial analysis.
- Approve expense statements and journal vouchers;
- Review and approves bank reconciliation;
- Prepare or approves ATPS payroll;
- Review weekly cash requirement;
- Approve file closures;
- Prepare/review quarterly statistics;
- Prepare/review contractual correspondence with donors and recipients;
- Assist with fundraising activities and review project budget proposals, contract and participant letters and revised budgets;
- Check accuracy of physical count of inventory of fixed assets;
- Ensure that proper financial project-monitoring records are maintained;
- Prepare ATPS' annual budget and monitors periodically actual expenditures in relation to approved budget.
- Visit ATPS-assisted projects in the region to assist recipients in resolving, financial difficulties and to monitor projects financial administration;
- Liaise with ATPS National Coordinators in order to assist with the smooth operation of their respective chapters;
- Ensure timely preparation of ATPS budgets and submission of financial statements to the Board;
- Work with the external auditors in performing their statutory duties to ATPS; and
- Ensure implementation of overall ATPS financial policies and procedures;
- Supervise the day-to-day activities of accounting staff and ensures proper coordination between their functions.

#### **B. Administration**

- Ensure order and cleanliness in the office's premises;
- Monitor leases and related obligations regarding the

office premises; supervise the use and maintenance of office equipment and vehicles;

- Administer insurance policies for office property;
- Ensure regular and timely transmission and delivery of mail and other communications;
- Maintain and update inventory of office assets;
- Maintain data on relevant supplies and their sources; Procure and maintain office equipment and supplies;
- Consult with the Executive Director and Research Coordinator on equipment to be purchased for projects and arranges the relevant purchases according to existing policies and procedures;
- Supervise the handling of all incoming and outgoing shipments;
- Correspond with project personnel on purchasing and shipping matters; examine and endorse delivery notes/ invoices prior to payment;
- Process documentation for work permits, visas, house leases, and in other matters relating to expatriate employees and their dependants

#### **C: Human Resources**

- Monitor requirements of ATPS-recruited personnel and arranges recruitments;
- Administer staff benefits, i.e. medical, insurance, and provident fund schemes;
- Maintain personnel files and data and Processes leave applications for all ATPS staff
- Arrange performance appraisal and review of ATPS-recruited staff;
- Co-ordinate training programs for ATPS locally recruited staff.
- Monitor deployment of staff and work allocation to ensure that ATPS's resources are efficiently utilized to serve clients and that all employees have an equal opportunity for development and progression;
- Review and recommend alternative work allocation methods and/or use of temporary staff with heads of departments, in instances of excessive overtime;
- Monitor, on a monthly basis, utilisation of employees and advise heads of department and the Executive Director;
- Annually revise daily per diem rates and establish and update appropriate per diem rates on a regular basis;
- Ensure that department heads conduct project appraisals, quarterly and annual Appraisals for each employee and ensure training and development takes place and is evaluated;
- Prepare the total revenue and operating costs of the

[continued on next page](#)

# OPPORTUNITIES

## VACANCY ANNOUNCEMENT AT ATPS ...continued

organization during the annual salary review process in consultation with department heads for consideration by a remuneration review committee for approval by the Executive Director;

- Review the medical insurance scheme and group life insurance scheme on an annual basis and make recommendations to the Executive Director on renewal of the scheme;
- Authorize absence from work in the absence of employee's immediate supervisor; compile quarterly Absence Reports, to be reviewed by the Executive Director and Heads of Department;
- Take corrective action through counselling, training and/or instituting disciplinary procedures, where problems of lateness and absenteeism persist;
- Investigate all disciplinary cases with the respective head of department and will be a member of the Disciplinary Committee.
- Arrange for new employees' orientation with the immediate supervisor

### Required skills and qualifications

- An undergraduate Degree in a Business-related field with a relevant certificate as a Certified Public Accountant. An MBA will be an added advantage;
- At least five years relevant progressive experience with an International NGO or equivalent;
- Excellent administrative skills;
- Excellent and proven ability to write and draw contracts;
- Computer literate: Word Processing, Spreadsheets (MS Office), Email, Internet.
- Fluency in English, written and spoken/Knowledge of French will be a distinct advantage;
- Experience in human resources management will be a distinct advantage

The vacancy is expected to be filled on or before 15 February 2016. The initial contract period will be for one year, renewable based on performance.

A competitive salary and benefits package will be offered to the successful applicant following ATPS' established salary scales. Qualified candidates should send a detailed letter of interest and curriculum vitae to [executivedirector@atpsnet.org](mailto:executivedirector@atpsnet.org)

### Contact Address:

The Executive Director, African Technology Policy Studies Network (ATPS), 3rd Floor, The Chancery Building, Valley Road, P.O. Box 10081 00100 GPO, Nairobi, Kenya, email: [executivedirector@atpsnet.org](mailto:executivedirector@atpsnet.org)

## 7th Africa Agriculture Science Week (AASW) and FARA General Assembly

The AASW and FARA General Assembly is the principal forum for all stakeholders in African agriculture science, technology and innovation to take stock of their collective achievements over the past three years and craft a common agenda along with modalities for achieving their collective targets over the next three years.

**You are invited to the 7th AASW and FARA General Assembly which will take place in Kigali, Rwanda, 13-16 June 2016.**

For more information visit FARA webpage on <http://faraafrica.org/7th-africa-agricultural-science-week-aasw-and-fara-general-assembly/>

## World Press Institute Fellowship 2016 for Journalists

The World Press Institute Fellowship (WPI) fellowship is offered to 10 journalists from countries around the world. It provides immersion into the governance, politics, business, media, journalistic ethics and culture of the United States for experienced international journalists, through a demanding schedule of study, travel and interviews throughout the country. The program begins in mid-August and ends in mid-October

**Application deadline: February 15<sup>th</sup> 2016**

More information: <http://www.opportunitiesforafricans.com/world-press-institute-fellowship-2016-for-journalists-usa-fully-funded/>

## Call for papers: National Science week, 2016

The National Commission for Science, Technology and Innovation in partnership with the Ministry of Education, Science and Technology have organized the 5th National Science Week to be held from 16th to 20th May, 2016 in Nairobi. The event comprises of exhibition, robotics contest and a conference.

**Submission of papers and write ups on exhibitions  
Deadline: 14th April 2016**

More information on: [http://www.nacosti.go.ke/images/docs/Call\\_for\\_Abstracts\\_NSW\\_2016\\_Rev\\_11\\_15.pdf](http://www.nacosti.go.ke/images/docs/Call_for_Abstracts_NSW_2016_Rev_11_15.pdf)

## The World Academy of Sciences (TWAS) 2016 Prizes

The TWAS Prizes are awarded to individual scientists from developing countries in recognition of an outstanding contribution to scientific knowledge in nine fields of sciences and/or to the application of science and technology to sustainable development.

**Application Deadline: 29 February 2016**

More information on <http://twas.org/opportunity/twas-2016-prizes>

## OPPORTUNITIES

### Leadership Course For Climate Practitioners

Applications are now open for the Oxford Adaptation Academy: A joint venture between the Smith School of Enterprise and the Environment at Oxford University, and the Global Climate Adaptation Partnership (GCAP). Now in its 7th year, its Alumni are drawn from the UN organizations, development banks, NGOs and government.

This two weeks course runs from 14 – 27 August, 2016.

More information on: [ldowning@climateadaptation.cc](mailto:ldowning@climateadaptation.cc)  
<<mailto:ldowning@climateadaptation.cc>>

### The World Academy of Sciences (TWAS) 2016 Prizes

The TWAS Prizes are awarded to individual scientists from developing countries in recognition of an outstanding contribution to scientific knowledge in nine fields of sciences and/or to the application of science and technology to sustainable development.

**Application Deadline: 29 February 2016**

More information on <http://twas.org/opportunity/twas-2016-prizes>

### Training Course On GIS and Remote Sensing For Agricultural Resource Management

Indepth Research Services have organized a Training on GIS and Remote sensing for agricultural resource management which will held in June 13 – 17<sup>th</sup> 2016 in Nairobi Kenya. Agricultural experts, soil scientists, Animal Scientists, agronomist, entomologists, ranch managers, farm managers, environmentalist, farmers and students are encouraged to apply.

**Application Deadline: 06 June 2016**

More information on <http://reliefweb.int/training?source=8233>

### Netfund Green Innovations Award

Are you a Kenyan entity with a unique initiative or idea that is promoting environmental solutions in the areas of: Energy, Waste management, water conservation or agribusiness? Enter the National Environment Trust Fund (NETFUND) Green Innovations Award and stand a chance to turn your green project into a great company!

**Application Deadline: 6 February 2016**

More information on <http://gia.netfund.go.ke/#/>

### Call for Papers: 4th International Conference- Society for the Advancement of Science in Africa (SASA)

The Society for the Advancement of Science in Africa (SASA) in collaboration with the Commission for University Education (CUE) Kenya are organizing the 4th International Conference with the theme “Transforming Africa through science, technology and Innovation” at the UNEP Headquarters in Nairobi from the 22nd-26th August 2016. The ATPS will be co-hosting this conference among other organizations.

**Deadline for abstract submission: 1st June 2016**

More information on: <http://www.sasascience.org/> or follow the conversation on twitter #SASA2016

## NEW APPOINTMENTS



Abayineh Amare joined ATPS in January 2016 as a PhD research fellow funded by African Climate Change Fellowship Program (ACCFP). Abayineh holds a Bachelor of Science degree in Agricultural Extension and a Master's degree in Rural Development from Haramaya University, Ethiopia. At ATPS, his main responsibilities include; analysing and completing his PhD dissertation as well as participating in the duties of ATPS.

He previously worked for Jimma University College of Agriculture and Veterinary Medicine as a Lecturer and Researcher. He has engaged in research projects conducted by Swedish University of Agricultural Sciences (SLU) and Addis Ababa University that aimed at assessing the potential of an interdisciplinary large future research project on connections between mosquitoes, malaria, agroecosystems and rural livelihoods in Ethiopia. He has also worked with University of London, School of Oriental and African Studies, Addis Ababa as a Research Assistant under the Agricultural commodity trade, employment and poverty reduction research project. In addition, he has worked at Maichew ATVET College as an Instructor.

Abayineh has participated in international research training in Food Security and Sustainable Agriculture: the Future of Smallholder Farmers, Bonn, Germany; GCUA Summer School on the Course Food Security, Safety and Quality held at the Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden; Bio-Farming Training School held at Addis Ababa, Ethiopia; and Waterscape Ecology and Watershed Management and Restoration held at Jimma University, Ethiopia.

# PHOTO GALLERY 2015



ATPS Executive Director (far left) at the Global Bioeconomy Summit 2015 November, 25-26 Berlin, Germany



ATPS Executive Director (centre) during the third meeting of the First session of Governing Board of International Research and Training Centre for Science and Technology Strategy (CISTRAT)



From Left: Dorothy Njagi of ATPS, Dr Alphonsus Neba of African Academy of Sciences (AAS), Ernest Acheampong, Susan Gichoga of AAS and Dr. Nicholas Ozor of ATPS during the AESA Launch meeting at ATPS Boardroom.



First row 2nd from left: ATPS Director during the CTA Workshop 'Climate Change Solutions that Work for farmers' in Wageningen Netherlands



ATPS Research Officer Ernest Acheampong addressing delegates during the 2015 Sustainable Development Transition Forum in Incheon Republic of South Korea



From Left: Jonathan Stead, Shingi Muzondo both of South African Institute of International Affairs (SAIIA), Dr. Nicholas Ozor of ATPS, Renette Collins of (SAIIA), Bobadoye Oluwafemi and Dorothy Njagi of ATPS during the registration meeting of ATPS to the Africa Portal on 31st August 2015 at the ATPS Board Room.

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