Science*Policy*Africa

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In this issue:

Message from the President

Aderemi Kuku, AAS President

There is no doubt that we indeed had a memorable 10th AAS General Assembly (GA) in Kasane, June 21-22, 2016---with so many events that are bound to leave indelible marks in the minds of those who attended the GA. As to be expected, a substantial part of this edition of the Newsletter is devoted to the events of the GA in Kasane.

Firstly, we were very delighted that His Excellency Lt. General Steretse Khama Ian Khama, the President of Botswana graced the opening ceremony of the GA with his august presence, declared open the GA and was formally inducted as a Honorary Fellow of AAS - a position exclusively reserved for people of eminence who have made significant contributions to the objectives of AAS. Needless to say that the honour was a very befitting recognition of his extraordinary leadership in developing Science, Technology and Innovation resulting in the accelerated development of Botswana into one of the fastest growing economies in the world. Of particular significance was the inauguration by His Excellency of the Botswana Academy of Sciences as well as the formal induction of three of the Foundation Fellows of the new Academy. I seize this opportunity to congratulate the Academy and wish it resounding successes in the coming years.

A total of seven scientific lectures were given during the GA. Two of them were memorial lectures in honour of two AAS Fellows, Prof Ali Mazrui and Prof Paulus Gerdes. There was also the Olusegun Obasanjo Prize lecture given by the winner Prof Phillipe Rasoanaivo, a PhytoChemist from Madagascar. Unfortunately, we have since received the very sad news of the passing on of Prof Rasoanaivo. We could never have imagined that we were witnessing the last of the many awards that characterized his illustrious career. On behalf of AAS, I hereby express our heartfelt condolences to his family, wellwishers and the scientific community in Madagascar who have lost an illustrious son of Madagascar and Africa.

During the GA, there were also panel discussions that focused on how to promote inter-African science collaboration and communication, establish monitoring mechanisms and training younger scientists for requisite scientific and technological skills and using Science Academies, Universities and Research Institutions to achieve these and other sustainable developmental goals. Also, most of the 38 new AAS fellows elected in 2015 in various fields including Biosciences, Medical and Health sciences, Physical and Chemical Sciences, Mathematical Sciences, Engineering, Technology and Applied sciences, Cultural Sciences, Humanities and Social sciences, were formally inducted during the GA in Kasane. Also formally inducted were 15 AAS Affiliates each under forty years of age, elected for five years (2016-2020) because of their demonstrated immense research capabilities potentials in the various scientific fields. These Affiliates are expected, through interactions with and mentorship by senior scientists within and outside the AAS, to hopefully develop into world class scientists within the next five years. I seize this opportunity to congratulate and welcome into the fold all the new Fellows and all Affiliates.

I cherish the strong hope that the new Fellows will quickly identify with the hopes and aspirations of AAS, respond positively to any request to be of service to AAS and contribute their very best towards further rapid development of science, Technology and innovation on our dear continent.

It is now my great pleasure to congratulate our colleagues who have been in the news lately. So, I heartily congratulate 1) Prof Cato Laurencin of the University of Connecticut, USA, for being honoured by President Barack Obama with the National Medal of Technology and Innovation—the United States highest honour for Technological Achievement. 2)Prof Abdisalan Noor of KEMRI-Welcome Trust Research programme in Nairobi, Kenya, for being awarded the 2016 Chalmer's medal meant for younger researchers aged 46 and under, who are of outstanding merit; 3) Prof Baldwin Torto of ICIPE, Nairobi, for being elected a Fellow of the Entomological Society of America (ESA); 4)Prof Richard Awuah (who is member of the AAS Governing Council) for being appointed the Chairman of Governing Council of the University of Education, Winneba, Ghana , 5) Prof Dominic Makawiti of the University of Nairobi for being appointed the Ag. Treasurer of AAS and 6) Dr. Segenet Kelemu, Director General of ICIPE, for being awarded an Honorary Doctorate degree by Tel-Aviv University, Israel. For more information on these distinguished colleagues, please see pages 12 and 13 of this Newsletter.

Finally, it is with a heavy heart that I bring to your attention the passing on of two AAS Fellows: 1) Prof Ahmed Zewail of Egypt, the 1999 Nobel Prize winner for his work on the study of chemical reactions over immensely short time scales. 2) Prof Phillipe Rasoanaivo, winner of the Olusegun Obasanjo Prize awarded to him in Kasane for his use of traditional medicine to improve the efficacy of existing drugs for brain disorders and also for treating sexual dysfunction among men (Please see page 13 of this Newsletter for further information on these departed colleagues.) May their souls rest in perfect peace.

From the ED's desk

The last issue of Science*Policy*Africa came during the 10th General Assembly (GA) of the African Academy of Sciences held in Kasane, Botswana, where we were especially honoured that the President of Botswana, His Excellency Lieutenant General Dr Seretse Khama Ian Khama attended as our chief guest.

President Khama spoke eloquently on the need for African leadership to increase funding for science, and shift the centre of decision-making on support to African science to the continent. That he flew nearly a 1000 Km from the capital just to attend the Academy's meeting, and the content of his speech, were clear demonstration of his commitment to science. For me, this is one more example of the growing optimism that I am sustaining seeing the changing profile of Africa political leaders and their increasing belief in science. I am eager to see this translated into more support for science and to empower scientists to conduct more research to meet the needs of the continent.

There is correlation between scientific output and funding. Countries which have invested in science have seen a growth in the number of researchers and research outputs. Kenya has decided to raise its financial allocation to science to 2% of its GDP; Egypt has doubled its gross expenditure on R&D every two years since 2007, and Ethiopia spent 0.61 per cent of GDP in 2013 on R&D, a drastic improvement from 0.24 per cent in 2009.

Africa is the most youthful continent on the planet, with 200 million people between 15 and 24 years old and by 2040, the continent will have more than 1.4 billion people of working age – more than China or India. These young people are a resource that, if empowered and supported, can solve some of the continent's developmental challenges. Our youth need training and mentorship to develop their research careers. This is why the AAS is focused on training the next generation through its DELTAS Africa, CIRCLE and other programmes.

With the excellent team of managers under a superior leadership we have at the Alliance for Accelerating Excellence in Science in Africa (AESA), the AAS has also created partnerships to support PhD and postdoctoral training. Our current call is in partnership with Swiss institutions that include the University of Basel and provides visiting fellowships to the aforementioned.

There are other partnerships in the pipeline focusing on postdoctoral fellowships as we believe this is a critical component in the 15 to 20-year process of developing research leaders. We believe that such a programme will enable scientists to advance their careers faster as it often allows them to transition into research leaders.

I also want to draw attention of our Fellows and other readers about three of our upcoming activities:

(1) In October, AESA will host two sessions at the Bill & Melinda Gates Foundation's annual Grand Challenges meeting in London, namely, '***the African Research Ecosystem: the seen and unseen connections***', and '***the Adoption of New Technologies in Africa***'. The sessions will discuss how best to raise funding for science, technology and innovation from policymakers and promoting the regulatory environment to encourage the use of new technologies;

(2) In December, the AAS will also hold the CIRCLE (Climate Impacts Research Capacity and Leadership Enhancement) programme's Champions Meeting. This is a meeting for leaders of universities and research institutions involved in the climate change programme.

Berhanu Abegaz, Executive Director, AAS

(3) Thirdly, in collaboration with the Academy of Science of South Africa we plan to host a roundtable on International Networking Opportunities for African Young Scientists. We will highlight the Lindau Nobel Laureate Meetings, as a case study to discuss the impact of programmes to develop young scientists and how they can be supported to enhance their contribution to the science, technology and innovation sector.

The Academy continues to count on the support of our Fellows and the greater science community to ensure we successfully fulfil our mandate of driving scientific and technological development in Africa. So much progress has been made in this endeavour and we need to keep the momentum for the sake of the continent and its future generations.

Now is the time!

President Khama inducted as an Honorary Fellow of the AAS

AAS President, Prof Aderemi Kuku (left) presents the certificate of induction to His Excellency Lt Gen Dr Seretse Khama Ian Khama

The President of Botswana, His Excellency Lieutenant General Dr Ian Khama was in June 2016 inducted as an Honorary Fellow of the African Academy of Sciences in recognition of his contribution to developing science.

AAS President Aderemi Kuku awarded the Honorary Fellow certificate to President Khama at the Academy's 10th General Assembly held in Botswana.

An Honorary Fellowship is given to individuals who have contributed to assisting the Academy achieve its vision and mission of driving scientific and technological development in Africa.

During AAS General Assemblies, the academy discusses topical scientific issues affecting Africa and find means of how research can inform policy.

In his keynote address, President Khama highlighted the importance of science in improving the lives of Africans and called for more local funding for the sector.

His Excellency LT General Dr Khama has been president of the southern African country since 2008, a position he assumed after having served as Botswana's Vice President from 1998 to 2008.

His Excellency Lt Gen Dr Seretse Khama Ian Khama was a minister for Presidential Affairs and Public Administration in 1998, the first position he held after joining politics when he retired from the Botswana Defence Force. His illustrious military career began at the Royal Military Academy in Sandhurst, England, where he did his tertiary education. He is a trained pilot who joined the paramilitary Police Mobile Unit in 1973. The unit was the forerunner of the Botswana Defense Force, which was created in April 1977 and made Khama its deputy commander.

President Khama has received a number of honours and awards including the Presidential Order of Honour, Founder Officer Medal, Duty Code Order and the Distinguished Service Medal. He was awarded the Conservation Award by the African Safari Club in the US in 1991 and the Endangered Wildlife Trust Statesman Award in 2001.

The establishment of the first University of Science and Technology, and the Botswana Academy of Sciences are solid evidences to show Botswana's commitment to science under his leadership.

Science for SDGs discussed at AAS 10th General Assembly

As part of the 10th General Assembly of the African Academy of Sciences, a number of panel discussions were held which focused on how Africa can achieve the Sustainable Development Goals. The discussions mainly centred on how science can be used to better achieve SDGs as it steps its role to contribute to evidence-based policymaking.

The panel comprised Prof Aggrey Ambali, Head of NEPAD Science, Technology and Innovation Hub; Prof Roseanne Diab, Executive Oficer, Academy of Science of South Africa; Prof Hubert Gijzen, Director, UNESCO Regional Office for Southern Africa; Dr Marian Nkansah, Senior Lecturer, Kwame Nkrumah University of Science and Technology (KNUST); and Professor O. D. Makinde, Professor of Applied Mathematics and Computations, Stellenbosch University.

Science*Policy*Africa lays out four priorities for how African countries can engage the scientific community, based on the outcome of the panel discussions:

1. Promote intra-African and disciplinary collaboration

The SDGs are interconnected with the success of one relying on another. For example, peace and security are necessary for eradicating poverty. Achieving food security also requires promoting gender equality by ensuring that African women, who make up two-thirds of the agricultural labour force and produce the majority of Africa's food, have access to essential inputs—land, credit, fertilisers, new technologies and extension services -—like their male counterparts, which currently isn't the case.
To effectively harness science to better achieve SDGs and to understand the implications of the solutions science provides, a mix of both STEM and social sciences is required. For example, dealing with the recent Ebola crisis in West Africa required an understanding of the virus and the development of drugs to combat it. This was in addition to understanding people's attitudes to burying the dead, washing hands and their way of life to effectively control the spread of the disease. Intra-African collaboration is also essential to maximise the use of limited human and infrastructural resources and because countries share common problems.

2. Establish monitoring mechanisms and training the required skills

Science can provide data to efficiently monitor and evaluate countries' progress in achieving SDGs. But for policymakers to understand the data, it needs to be interpreted by trained mathematicians. This will require the continent to train more people to analyse and interpret the data.

3. Promote science communication

Science needs to engage with the public and policymakers to ensure that they are constantly aware of the research that is available. To do this, scientists need to be open and transparent and honest about what is certain and what isn't to build policymakers' and public trust. They also need to ensure that the advice is delivered in a simple language that is easily understood by policymakers, most of whom are not scientists. Timing is also important as it ensures relevance and improves research uptake.

In turn, governments need to be ready to receive and act on the advice and be transparent in policymaking.

4. Use science academies to provide the evidence

The number of Academies in Africa is slowly increasing, as has been the dialogue between them and respective governments. For example, the AAS is a strategic partner of the AU, providing scientific advice and partnering with the continental body's agencies in programmes to develop science. National academies can provide that collective voice and be a resource for policymakers needing evidence for their policies or experts to consult.

DELTAS Africa hold first annual meeting

The Developing Excellence in Leadership, Training and Science (DELTAS) Africa held its first annual meeting in Nairobi, Kenya, 5-6 July 2016. Over 100 grantees from the 11 DELTAS Africa programmes participated in the meeting to discuss the leadership needs of the programme, how to mobilise funding from African philanthropists to fund research and monitoring research performance, among other topics. Each of the Directors presented the objectives of the their programmes at the event, The grantees also had the opportunity to share their expertise and expectations of how the programme will be implemented.

The full list of DELTAS Africa awardees is available on www.aaasciences.ac.ke/deltasafrica

School Science Curricular: challenges and opportunities for scientists

How science should be used for best effect has not been uniform across different contexts. A well-considered school science curricula underpins all national strategies to promote the beneficial application of science. This paper highlights the important contribution that scientists can and should play in such considerations. The authors of this paper have particular experience of the physical sciences (physics and chemistry) and reflects in their arguments.

School Science Education

From the educational viewpoint, school science education is important both for those wanting to follow a career in the sciences and those who do not. In the past, the former category of learner seems to have been the main target of curriculum designers, but to an increasing extent the other category of learner has risen in importance. The trend is influenced by the recognition of the increasing influence of science on the lives of all, as well as the kinds of employment opportunities that go with this. The trend may be exemplified by the recommendation in an EU report: Recommendation 1: The primary goal of science education across the EU should be to educate students both about the major explanations of the material world that science offers and about the way science works. Science courses whose basic aim is to provide a foundational education for future scientists and engineers should be optional (Osborne and Dillon, 2008).

For scientists who may be unfamiliar with implications of the distinction that is being made, some elaboration may be appropriate. The distinction may be expressed as "normal science education" versus "science education for all".

"Normal Science Education"

The description "normal science education" alludes to the characterization of normal science (Kuhn, 1962) as puzzle-solving within a framework of established paradigms. This leads to school science curricula that support normal science and which (according to van Berkel (2005) tend to be isolated from common sense, everyday life and society, the history of science, the philosophy of science, other sciences, technology and contemporary research. This devastating judgment may be reflected in surveys of learner views about the relevance of science education. There is general recognition of the benefits of science for society; this recognition is stronger in less-developed countries (6 were from Africa). However, in response to the statement "I would like to become a scientist" less than 40% of learners in developed countries agreed, whilst 70% of those from less-developed countries did. The survey report notes, in poor countries "everybody" wants to become a scientist or to work with technology, but very few get the possibility (Sjøberg and Schreiner (2010)).

Science Education for All

This is linked with the concept of scientific literacy and public understanding of science. It aims to prepare future citizens to function more effectively in an increasingly science-driven future. Such an aim is to be found in the science curriculum documents of several countries, even though the curriculum remains firmly "normal". The challenge is to develop curricula suited to the goal of scientific literacy, one expression (OECD PISA (2013)) of which is: *The capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.* School curricula have been developed for this purpose (e.g., Applying Knowledge in Context in the USA (NSTA) and Chemie im Kontext in Germany (IPN)). Science in context (rather than isolated) is the way to achieve both scientific literacy and positive learner interest.

Challenges and Opportunities in Africa

Abegaz (2016) has written about the challenging character of chemistry education and research in Africa, but is optimistic. He notes that Africa has youth on its side and this "makes investment crucial: to provide good-quality, relevant education which will lead to employment opportunities." He goes further and refers to the lack of relevance of most teaching materials, the need to encourage critical thinking and to equip learners to tackle complex issues such as environmental, energy-based and economic questions. Although chemistry provided the disciplinary framework for these views, they are relevant in other scientific disciplines and support the case for school science curricula that provide science education for all and recognizes that scientific awareness in our rapidly developing societies depends on being involved with science. Many scientists in Africa are interested in improving school science. They may not have pedagogical expertise, but that is something that educators can contribute. Scientists have something different to contribute, and they should. And the AAS hass a role in this.

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Science advice:

essential element for development in Africa

Science advice is always a matter of discussion and debate with respect to the vital global issues from climate change to cyber-security, poverty to pandemics, food technologies to fracking and other controversial issues which may be raised between experts or scientists and non-scientific parties including policy makers, media and the public[1,2].

The need for science advice to fulfill the hopes of people and countries for better life was clear upon Arab spring which was born in North African countries such as Tunisia, Egypt and Libya. After Arab spring, major changes had happened on the level of countries and individuals who became much demanding for better living conditions. Therefore, with internet revolution and open skies, the people became not only in need for better political life or real parliamentary representation but they also knew more about their normal human rights which were considered as dreams. The people found their dreams mentioned in SDGs as rights from saving essential life needs as healthy adequate food, clean water, affordable and sustainable energy, healthy life, education, etc, to other vital concerns as clean environment, women rights, equality between countries, promotion of sustainable development, etc[3].

Similarly, same challenges are found on the whole African level where major recent changes accelerated the need for immense science advice movement along the continent. African countries must share and exchange useful policies on science and this may endorse open dialogue among scientists, policy makers, national leaders and the African countries themselves at the critical interface between policy and science on key concerns like water, food, energy and related matters for sustainable development.

It is time for African countries to redirect their economies to be knowledge-based economies which support the role of science and scientific thinking in solving national and global problems. African political leaders must work with scientists to find real effective solutions for the common problems. There is need for concerted efforts from stakeholders, scientists, policy makers, NGOs, etc to reformulate science and technology policies to enhance development and sharing of best practices. Scientific cooperation must be encouraged between countries.

Additionally, effective engagement in south-south cooperation beside developing strategic plans between Africa and new or emerging development partners will lead to successful unique science advice models based on exchanging successful experiments with countries which had similar problems and conditions faced by African countries[4]

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About the author

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The Epidemiological Transition

The Royal Society of Tropical Medicine and Hygiene, in collaboration with the African Academy of Sciences, held a two-day scientific meeting in Nairobi, Kenya, from 07 - 08 July 2016.

The two-day meeting provided an opportunity for researchers from a wide range of disciplines to present latest developments around the theme of **"the epidemiological transition"**.

Featuring keynote presentations from research leaders across the African continent, the meeting covered both communicable and non-communicable diseases, drawing on basic, clinical and health systems research.

About 200 people attended the meeting. Some of the keynote speakers and presentations were:

- "No health without mental health" - Dr Dixon Chibanda, University of Zimbabwe
- "Life without worm infections" - Prof Alison Elliott, MRC / UVRI Uganda
- "Leveraging advances in health informatics to support clinical research and improve services" - Prof Mike English, KEMRI, Kenya
- "Emerging viruses in Africa in a context of health transition" - Dr Amadou Sall, Institut Pasteur de Dakar, Senegal
- "Global Health Science in Africa: conducting research in the field, at the bedside and at the bench" - Prof Tariro Makadzange, University of Zimbabwe
- "The NCD epidemic in Africa - a metabolic legacy of early undernutrition?" - Prof Moffat Nyirenda, University of Malawi
- "Human schistosomiasis in the post Mass Drug Administration era" - Dr Francisca Mutapi, University of Edinburgh

Young investigators, including PhD students and post-doctoral researchers, presented their findings on a wide range of disciplines and disease areas.

AAS holds 10th General Assembly

Singing the Botswana national anthem on the arrival of His Excellency Lieutenant General Dr Seretse Khama Ian Khama, The President of Botswana.

HE Lt Gen Dr Seretse Khama Ian Khama addresses the 10th AAS General Assembly. He stressed the importance of science in developing African countries

African Academy of Sciences President Prof Aderemi Kuku giving his welcome remarks at the AAS 10th General Assembly

AAS Executive Director Prof Berhanu Abegaz was the Master of Ceremony for the opening of the General Assembly (GA).

AAS Fellow and CEO of the Botswana Institute for Technology Research and Innovation (BITRI), Prof Nelson Torto, giving a scientific lecture at the GA.

Prof Motsopetse Modisi, President of the Botswana Academy of Sciences (BAS), introducing the new BAS Fellows to be inducted.

AAS Fellow and DST Chair at the University of South Africa (UNISA), Prof Catherine Odora-Hoppers, giving the Ali Mazrui Memorial Lecture.

Prof Hubert Gijzen, Director, UNESCO Regional Office for Southern Africa, giving his remarks on using science to better achieve the Sustainable

Prof Roseanne Diab, Fellow of AAS and Executive Officer of the Academy of Science of South Africa, speaks on using science to better achieve SDGs.

Prof Ben-Erik Van Wyk (left) of the University of Johannesburg, South Africa, and Fellow of AAS gave the Paulus Gerdes Memorial Lecture.

Prof Aggrey Ambali, Head of STI Hub, NEPAD Agency, speaking about the need for Africa to use science to better achieve SDGs.

AAS Fellow Prof Oluwole Makinde of Stellenbosch University, South Africa, speaks about the need to collect and use data to monitor the progress of SDGs.

AAS holds 10th General Assembly

Hon Nonofo Molefhi presents Prof Nelson Torto (right) with his certificate of induction as a Fellow of the Botswana Academy of Sciences (BAS).

AAS Affiliate Dr Dickson Andala (right) of Kenya, receives his certificate of induction at the 10th AAS General Assembly.

Prof Christopher Chetsanga, AAS Membership Advisory Committee (MAC) Chair for Biosciences introducing new Fellows who were inducted in Biosciences field.

AAS Fellow and AESA Director, Prof Tom Kariuki, presents certificate of induction to AAS fellowship to Prof Kevin Marsh, AAS Senior Advisor.

Prof Vincent Titanji, AAS Vice President for Central Africa, giving his input during a Question and Answer session for the 'Science in SDG' panel.

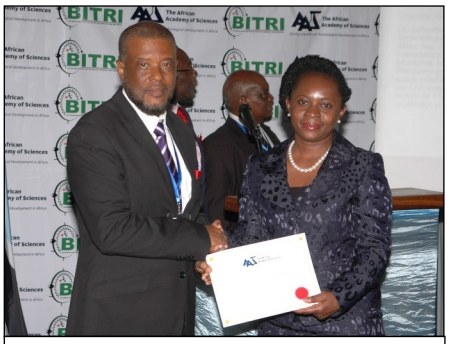
A session of New Fellows of the African Academy of Sciences (AAS) after their induction.

Prof Eleni Aklillu (right) receives her certificate of induction as AAS Fellow from Dr Tom Kariuki.

Dr Banothile Makhubela (first from right) from the University of Johannesburg in South Africa receives her certificate of induction as AAS Affiliate.

AAS Fellow Prof Balkiss Bouhaoula-Zahar from the University of Tunis making a comment during the General Assembly.

His Excellency Lieutenant General Dr Seretse Khama Ian Khama, in a group photo with AAS Fellows after the opening plenary at the General Assembly.



Prof Richard Awuah, AAS Regional Representative for West Africa, presents certificate to AAS Affiliate Dr Augustina Sylverken from KNUST, Ghana.

A group photo of AAS Executives and staff of AAS secretariat with the new AAS Affiliates after their induction at the 10th General Assembly of AAS.

First cohort of AAS Affiliates inducted

The African Academy of Sciences has inducted 15 young scientists selected for the first cohort of a programme to recognise, mentor and help early career professionals develop into world class research leaders. The 15, who are PhD holders and below the age of 40, were selected from the five regions of Africa to be AAS Affiliates for a five-year period running from 2016 to 2020. They were inducted at the AAS 10th General Assembly taking place in Kasane, Botswana.

The Affiliates have shown potential in their respective fields that include biosciences, geology and health scientists. AAS will work with their institutions to offer them training in areas that include proposal writing and manuscript preparation to help them win more grants and improve their publication records, respectively. Other training will be offered in ethical research conduct and intellectual property to ensure they are equipped with the knowledge need to develop their careers. Berhanu Abegaz, the AAS Executive Director said: "Unless we provide opportunities to attract, train and retain our young scientists, especially those who are showing promise in their different fields, through a rewarding career path we will continue to lose them." Africa loses 20,000 thousands of professionals every year to developed countries some of whom are scientists who are frustrated by the lack of infrastructure and mentors.

AAS Affiliates will be mentored by experts in their fields from across the globe, some of whom are senior scientists drawn from AAS Fellows. Mentorship is a conduit for young professionals to gain the knowledge they need to be successful in their careers.

Central Africa

Dr Apinjoh Obejum
Field: Biosciences
Country: Cameroon

Dr Denis Zofou
Field: Biochemistry / Pharmacology
Country: Cameroon

East Africa

Dr Dickson Andala
Field: Materials chemistry
Country: Kenya

Dr Askwar Hilonga
Field: Chemical Engineering
Country: Tanzania

Dr Shubi Felix Kaijage
Field: Electronics and Information Engineering
Country: Tanzania

Dr Lucy Kananu Murungi
Field: Crop Protection
Country: Kenya

Dr Fredros Okumu
Field: Health Sciences
Country: Kenya

Southern Africa

Dr Edson Gandiwa
Field: Environmental Science
Country: Zimbabwe

Dr Banothile Makhubela
Field: Chemistry
Country: South Africa

Dr Christina Thobakgale-Tshabalala
Field: Biochemistry
Country: South Africa

West Africa

Dr Adewale Adewuyi
Field: Industrial Chemistry
Country: Nigeria

Dr Augustina Angelina Sylverken
Field: Clinical Microbiology
Country: Ghana

Dr Akomian Fortuné Azihou
Field: Tropical Ecology
Country: Benin

Dr Marian Asantewah Nkansah
Field: Chemistry
Country: Ghana

Dr Eucharia Oluchi Nwaichi
Field: Environmental biochemist
Country: Nigeria

Developing the next generation of globally competitive Health Researchers in Africa

DELTAS Africa is a programme at the African Academy of Sciences that seeks to address teething challenges in the area of health and health research in Africa.

This article would take you on a journey into the 'high value targets' or strategic thrusts of DELTAS Africa programme funded by the Wellcome Trust and the UK's DFID. It would also highlight the associated challenges inherent within the African health research landscape. More importantly, it would explore how the interventions proposed by the programmes are designed to address these challenges through building research leadership capacities with the overall goal of improving on the grim health and health research statistics on the continent. By working towards addressing these 'high value targets', DELTAS Africa hopes to produce the next generation of globally competitive health research leaders and high quality, high impact Africa-led and Africa –generated research that will positively and significantly influence health research priorities, health and health research strategies and health policies in Africa.

A total of 11 DELTAS Africa programmes are being funded across Eastern, Western and Southern Africa. It is expected that over 1200 emerging health research leaders at MSc, PhD, Post-Doctoral and Senior Research Fellows will be trained over the five year period of the programme. The research focus areas include mental health, bioinformatics and genomics, malaria, TB/HIV research, infectious diseases, NCDs, zoonotic diseases amongst others.

DELTAS Africa frames its 'high value targets' as follows:

1. **Research management and environment:** to cultivate professional environments within African research institutions and universities to manage and support high quality scientific research and thriving research enterprises;
2. **Scientific Quality:** to produce world-class research that addresses African health and research priorities, through scientific discourse and collaborative supervision;
3. **Research Training:** to strengthen scientific research training and build career pathways for scientific researchers.
4. **Scientific citizenship:** to foster mentorship, leadership and equitable collaboration in science, and engagement with public and policy stakeholders.

How would 'research management and environment' be addressed within the context of the DELTAS Africa? To better appreciate DELTAS Africa's intervention in this high value target, it is expedient to put the concept of 'research management and environment' into a proper perspective, and then explore the approaches other programmes and interested parties have adopted in addressing this particular 'high value target'. What is research management and environment? What does a typical research management and environment landscape in a typical African research institution or university look like? And why is it important to improve the research management and environment space within African? Research management is a well-established professional discipline with a number of professional outfits such as the Southern African Research and Innovation Managers Association (SARIMA), the East African Research and Innovation Managers Association (EARIMA), the West Africa Research and Innovation Managers Association (WARIMA), the Association of Common Wealth Universities (ACU), International Network of Research Management Organisations (INORMS) and many other similar entities being at the forefront of its development. These entities also provide professional development courses in furtherance of the profession. According to ACU, it embraces anything that universities can do to maximise the impact of their research activity, including assisting with identifying new sources of funds, presenting research applications, advising on the costing of projects, negotiating contracts with external sponsors and project management and financial control systems. Furthermore, research management can help in exploiting research results through, commercialization, knowledge uptake and dissemination to the wider society.

At the forefront of 'anything' that universities can do to maximise the impact of their research activity is the physical, internal, external, technological, competitive, philosophical, policy, regulatory, procedural, ethical and cultural environment in which the research is undertaken; and the financial resources dedicated for research. Accordingly, well-equipped and quality-assured laboratories and qualified and certified personnel are constituent parts of such research environments.

The United States of America's research and development (R&D) expenditures have hovered between 2.5% and 2.8% of GDP over the last three decades, while China's grew by 20% per year between 1996 and 2007. Only about two countries in Africa have R&D expenditures at 1% of GDP, with the majority still far below the 1% recommended by the Africa Union. Any keen observer of the African research environment understands the challenges that characterise them. The result is that highly qualified Africans trained usually outside Africa become square pegs in round holes when they return to the continent to continue the pursuit of their research careers. It is not surprising then that most of them chose to return to Northern research institution and universities or simply accept to remain within the challenging African research environment and gradually wither and die out professionally.

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News

Baldwy Torto Recognized by ESA

The Governing Board of the Entomological Society of America (ESA) has elected 10 new Fellows of the Society for 2016. Election as a Fellow acknowledges outstanding contributions to entomology in one or more of the following: research, teaching, extension, or administration.

AAS Fellow Dr Baldwyn Torto is among the 10 scientists named for recognition in 2016. He will be recognized during the 2016 International Congress of Entomology, which will be held September 25-30, 2016 in Orlando, Florida.

Dr Baldwyn Torto is a principal scientist and head of the Chemical Ecology Unit, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi, Kenya. He is internationally recognized for his research on the chemical ecology of mosquito vectors of infectious diseases, crop pests, honeybees, and research into entomophagy.

R T Awuah chairs University Council

AAS Fellow and member of AAS Governing Council, Prof Richard Tuyee Awuah is the new chair of the 6th Governing Council of the University of Education Winneba (UEW), Ghana.

Prof Richard Tuyee Awuah, in his acceptance speech acknowledged the previous council for the good work done during their period in office. He noted that having served for a while on the previous Council, the experience he has acquired will help the new council to safeguard all the resources of the university. He pledged on behalf of his team to work in harmony with all the constituent bodies of the University including Management, faculty, staff and students to maintain the University's position as the premier University of teacher Education in Ghana and the ECOWAS Sub-Region.

Abdisalan Noor wins Chalmers Medal

Prof Abdisalan Noor, fellow of the African Academy of Sciences, has been awarded the 2016 Chalmers Medal. Prof Noor is with the KEMRI-Wellcome Trust Research Programme in Nairobi, Kenya.

The Chalmers Medal is an annual award for researchers aged 46 years or under. The medal, which is in silver gilt, bears a likeness of Dr Chalmers over the motto *Zonae torridae tutamen* on the obverse, and on the reverse a representation of *Anopheles gambiae* above a spray of the cinchona plant and encircled by the name of the Society. He was an investigator who took a great interest in the work of younger researchers, and always ready with help and encouragement. With this in mind, the Chalmers medal is awarded only to researchers aged 46 or under.

Dr Cato Laurencin has been honored by President Barack Obama

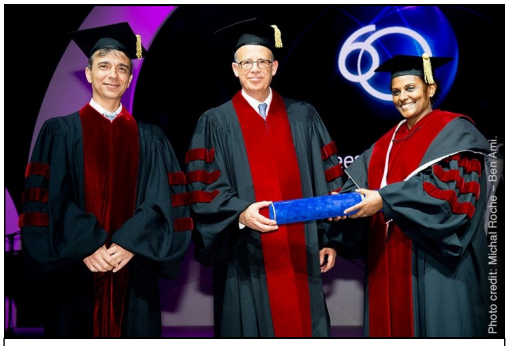
Dr Cato (left) with Pres Obama as citation is read for his winning of the nation's top honor for technological achievement
(Credit: Ryan K. Morris and National Science and Technology Medals Foundation).

AAS Fellow Dr Cato Laurencin has been honored by President Barack Obama with the National Medal of Technology and Innovation, the United States highest honor for technological achievement.

The citation of the award read aloud during the medal ceremony was: *"For seminal work in the engineering of musculoskeletal tissues, especially for revolutionary achievements in the design of bone matrices and ligament regeneration; and for extraordinary work in promoting diversity and excellence in science".*

News

Segenet Kelemu Honoured



Dr. Segenet Kelemu (right) receiving her honorary doctorate at Tel Aviv University

AAS Fellow and icipe Director General, Dr Segenet Kelemu, has received an honorary doctorate from Tel Aviv University (TAU), Israel. Dr Kelemu was honoured for her pioneering role for women scientists in Africa; her leadership in the fight for providing new solutions for ecologically responsible food crop production, especially by local, small-scale farmers in Africa; her commitment in directing the major effort, through international collaboration; for the transformation of African agriculture into self-sustainment that will meet the goals of feeding the people; her international acclaim as recipient of prestigious awards such as the UNESCO Award for Women in Science in 2014, and her serving on advisory boards of key international institutions; and her support in the establishment of the Manna Center Program in Food Safety and Security of Tel Aviv University.

Makawiti Apppointed Acting AAS Treasurer

The AAS Governing Council has appointed Prof Dominic Makawiti to serve as the Acting Treasurer of the Academy.

Dominic Makawiti is Professor of Biochemistry in the University of Nairobi and was also Vice Chancellor of Maseno University in Western Kenya. His research interests cover biochemical endocrinology and he holds the Head of State Commendation (HSC) awarded by His Excellency, the President of the Republic of Kenya.

As Treasurer of the Academy, he will be a member of the Management Committee, the Governing Council and as ex-officio member of the Audit and Risk Committee of AAS.

Prof Makawiti's appointment is effective from 22 August 2016.

Two AAS Fellows pass away

Philippe Rasoanaivo

AAS fellow and winner of 2015 Olusegun Obasanjo Prize, Philippe Rasoanaivo, has passed away. He received the Olusegun Obasanjo Prize for scientific discovery and/or technological innovation at the 10th General Assembly of AAS in April 2016. This was the last of many awards he won in his illustrious career. Prof Philippe Rasoanaivo won the prize for using traditional medicine to improve efficacy of existing drugs for brain disorders and also treating sexual dysfunction among men. Before his death, Prof Rasoanaivo worked for both the Institut Malgache de Recherches Appliquées, Fondation Rakoto Ratsimamanga (Malagasy Institute of Applied Research, Rakoto Ratsimamanga Foundation) and the University of Antananarivo.

Ahmed Zewail

Egyptian AAS Fellow Ahmed Zewail, who won the 1999 Nobel Prize for his work on the study of chemical reactions over immensely short time scales, has died. Over nearly 40 years at Caltech (The California Institute of Technology), Zewail and his students pioneered the field of femtochemistry, the use of lasers to monitor chemical reactions at a scale of a femtosecond, or a millionth of a billionth of a second. Using Zewail's techniques, scientists can observe the bonding and busting of molecules in real time. The research could lead to new ways of manipulating chemical or biological reactions as well as faster electronics and ultra -precise machinery.

Opinion:

Unpacking Africa's enigma with INDCs - Johnson Nkem

The Intended Nationally Determined Contributions (INDCs) was a unifying element among the Parties that underscored the adoption of the Paris Agreement. By providing a platform for Parties to set their own targets, INDC is perceived as ushering in the flexibility required for nationally accommodating measures for addressing climate change. However, the differences in understanding of INDC among Parties from the onset of its introduction into the negotiations, especially in with modalities and expectations of delivery, is likely to significantly perturb and distort its internalization and implementation in different regions.

The INDC could be applauded for providing the mode of comparing countries' ambitions and how commensurate it is with their capabilities. Nevertheless it undermines differentiated responsibilities of Parties for its realization. While INDC set new signposts for achieving emission reduction, this is not the same for the reduction of vulnerability and enhancing adaptation for those struggling with the challenges of climate change impacts, especially under the global goal for adaptation. As a result, there are major concerns with representativeness of INDCs of many African countries that are likely to pose challenges with their domestication, particularly in countries were the ownership for their preparation rests with entities and individuals other than nationals, either because they were totally outsourced or partially conducted without adequate participatory consultations to ensure adequate comprehension of local specificities. Thus, the current nature of INDCs for some countries is likely to place an additional burden and endurance principally on some African countries - this time, not just from climate impacts but also from climate policies.

Following the signing of the Paris Agreement, attention has turned to implementation. While INDCs captured the spotlight of the agreement, financing its realization unfortunately faded into the blind spot of the discussion in the buildup to the agreement and thereafter. The absence of a common understanding on these crucial aspects of financing the INDCs could in some cases inopportunely highlight differences in the perception of what exactly they entail. While one could interpret INDCs as national contributions based on national capabilities including finance, capacity and technology, it could also be argued that they reflect national contributions based on availability of means of implementation as enlisted by Parties from both domestic and international sources where applicable. Such a dichotomy in views requires structural clarification along the same lines of the principles of the Convention.

- **Did Africa over pledged?**
- **How feasible is it for African countries to internalize their INDCs in its current form?**
- **As the only global region bearing the greatest brunt of climate change, and locked in other developmental prerogatives and challenges, can Africa really fund its own responses to climate change impacts as unconditional contributions using domestic resources; irrespective of how marginal this could entail?**
- **Is it ethically and morally acceptable to further risk the impoverishment of many more people by deploying scarce national resources for the implementation of INDCs?**

The domestication of INDC in Africa

National ownership of the Paris Agreement would open the gateway for its implementation alongside national programmes. However, in revisiting the INDCs of African countries, there are fundamental questions that inevitably prop up and could baffle anyone. These include:

1. Did Africa over pledged?
2. How feasible is it for African countries to internalize their INDCs in its current form?
3. As the only global region bearing the greatest brunt of climate change, and locked in other developmental prerogatives and challenges, can Africa really fund its own responses to climate change impacts as unconditional contributions using domestic resources; irrespective of how marginal this could entail?
4. Is it ethically and morally acceptable to further risk the impoverishment of many more people by deploying scarce national resources for the implementation of INDCs?

The importance of collective responsibility as underscored in the Paris Agreement in addressing climate change, makes it an overarching goal to design sustainable solutions erected on capabilities. As Africa embarks on implementation of the INDCs, there are obvious challenges that will be encountered. The execution of the 'unconditional' actions listed in the INDC is likely to place a relational burden on the slim budget of several countries especially the smaller economies. This is most likely to be at the expense of other government services such as healthcare, and education.

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Unpacking Africa's enigma with INDCs

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Most countries still depend on ODA as budgetary support, and grants for dedicated climate change responses. National preparedness in terms of institutional framework and processes for national climate finance, is absent. National capability to tag and track dedicated climate change expenditures is nonexistent. Under these conditions, it is difficult to imagine how African countries will fund their unconditional actions enlisted in their INDCs.

Financing INDCs

An analysis conducted by CarbonBrief in December 2015, on financing INDCs, indicated that developing countries will require $3.5 trillion to implement their climate pledges by 2030, an equivalence of $233 billion a year, with an annual average of $42 billion per year from international sources between 2020 and 2030. Another study by IIED (November 2015), suggests it would cost the Least Developed Countries (LDCs) around US$93.7 billion per year to implement INDCs between 2020 and 2030. This represents $53.8 billion for mitigation, and 39.9 billion for adaptation.

Considering that 34 of the 48 nations that make up the LDCs are in Africa, the importance of a clear financing mechanisms of Africa's INDCs cannot be overstated. An analysis of African INDCs conducted by ACPC using countries that costed their contributions shows a funding architecture comprising 12% domestic funding, 40% international funding, and 48% with unspecified sources. Paradoxically, 56% of the total fund is for mitigation purposes while 32% for adaptation and 12% unspecified. Ironically for a continent whose climate response priority is adaptation this is a misnomer and questionable of the representativeness of the determinations.

Recommendations

It is important for Africa to continue to play active roles in mobilizing and advocating for a global response to climate change since it stands to benefit the most from a reduction of global emissions that eventually translates into a reduction in climate risks intensity and exposure for Africa. However, the continent must shape and peck its intended contributions to its capabilities in the areas of human capacity, finance and technology available or transferred, still within the framework for the implementation of the Paris Agreement. This could be achieved by revising and relocating some of the previously defined unconditional activities, to the conditional category. This will not change the ambitions of the intended national contributions, but simply provide a more realistic framework for its realization.

While greater focus has been placed on finance, it is fully recognized that there is an intrinsic lack of capacity and technology in Africa to undertake the implementation of all of the actions listed in the INDCs. It will therefore be crucial for African countries to further disaggregate their INDCs in order to identify the type of support in capacity and technology that will be required for their implementation either as conditionally or unconditionally.

Whether Africa likes it or not, dedicated domestic resources have become indispensable to satisfactorily address climate change to strengthen national appropriation and ownership at every level of intervention. Countries need to pay more attention in developing their national climate change finance framework so that it is anchored on the national budgetary system that provides a more holistic approach for resource mobilization from both domestic and international sources.

Conclusion

Following the preparation of INDCs, the architecture of climate financing is steadily drifting from solely expecting the fulfilment of financial pledges made by Annex I Parties, to embody Non-Annex I Parties drawing on their domestic resources for the implementation of climate change responses, especially in adaptation. Whether this was an accidental ploy or a deliberate undertaking, it is not more just about readiness to mobilize international resources but activities should steadily shift towards preparedness for the utilization of domestic resources needs. The ultimate goal of mainstreaming climate change into national planning and policy processes is the internalization of climate change into national planning and steadily wean Least Developed Countries from perennial external climate support. Such a transition is definitely inevitable but how soon remains the question. The transition from international to domestic funding has seemingly landed on a fastlane under INDCs which is likely to be bumpy and turbulent for many African countries whose abilities to mobilize resources from any source, remains extremely weak and, in some cases, non-existent.

Whether the symbolic expression of willingness to jointly address global climate change impacts through INDCs should now be cascaded into a responsibility for addressing climate change remains a question to ponder. Remember, Africa only contributes less than 5% of total global GHG emissions. This is highly insignificant to the common solution needed for curbing global temperature rise 'well below' the 2°C goal.

Disclaimer

The opinions expressed in this article are purely those of the author and do not, in any way, represent the views of the African Academy of Sciences, the organizations or others associated with the author.

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Developing the next generation of globally competitive Health Researchers in Africa

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In recognition of this challenge, DELTAS Africa identified the improvement of the African research management and environment as one of the strategic thrusts in its drive to train the next generation of globally competitive African health research scientists. Without being prescriptive, applicants for DELTAS Africa were required to propose competitive strategies for improving the research management and environment at their institutions, as one of the interventions towards attaining the broad objectives of DELTAS Africa. Each of the 11 programmes under DELTAS Africa has a strategy for improving the research management and environment of the lead institution, co-applicant and partner institutions, thus ensuring a ripple effect in the improvement of both lead, co-applicant and partner institutions. These strategies, fully funded by the DELTAS Africa programme are wide and varied. Some of these include setting up new or improved research support or management offices, provision of advanced grant financial training and management courses for both lead and partner or co-applicant institutions, provision of high value grant proposal writing training, building postgraduate student study facilities and libraries, building and equipping ultra-modern research laboratories, and building and equipping high performance computing and bioinformatics centres amongst others. Other important aspects of improving the research management and environment within the DELTAS Africa programme has been a deliberate though still nascent effort at auditing, documenting and making available information on resources and other research equipment and infrastructure across the 11 DELTAS Africa programme This strategy is intended to ensure maximum awareness and access to equipment, facilities and technical skills across the network to ensure maximum use and benefit of specialised equipment across the 11 DELTAS Africa programmes. It is also worth noting that positive institutional research cultures driven by progressive institutional leadership being an important part of the research organisation and environment is being actively promoted within DELTAS Africa. To this end, the programme management office, the Alliance for Accelerating Excellence in Science in Africa (AESA), based at the African Academy of Sciences (AAS) regularly undertakes advocacy trips to lead DELTAS Africa institutions to interact with senior executive management to advocate and drum up institutional support for the DELTAS Africa and research programmes and Fellows being supported under the DELTAS Africa scheme. A critical aspect of these advocacy visits is the involvement of high ranking government officials at the level of Ministers of Health, and Education, Scientific Research and Innovation as the case may be for DELTAS programme visited. The inherent value of gaining the political support of such high ranking governmental officials in DELTAS Africa programmes cannot be overemphasized.

A sound and strong research management culture and environment provides a strong foundation for developing strong researchers and strong research leaders. One important legacy of the DELTAS Africa programme will be such strong research management cultures and environments at the institutions where DELTAS Africa programmes are being implemented. It is hoped that such a legacy will continue to be a nursery for Africa's next and future globally competitive health researchers and scientists.

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