

At the frontline of developing science in Africa

Annual Report 2015



African Academy of Sciences

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Message from the President

The year 2015 represents a momentous milestone in the history of the African Academy of Sciences (AAS), as it celebrated its 30th anniversary. It is really my great pleasure to congratulate all past presidents—Profs Thomas Odhiambo, Mohamed Hassan and Lamine Ndiaye— as well as all other past and present members of the Management Committee, Governing Council and all Fellows of the AAS for their various contributions for making our Academy what it is today. I am happy to be the President of the AAS on this auspicious occasion of sending a message for this report because I am also celebrating my 30th anniversary as an AAS Fellow, having been elected in 1986. The AAS has made tremendous progress in the last 30 years with it honouring up to 330 distinguished African scientists as Fellows and promoting science, technology and innovation on the continent.

There were several unprecedented and newly established activities in the AAS during 2015. Notable is the Alliance for Excellence in Science in Africa (AESA) together with its initiatives—the Developing Excellence in Leadership, Training and Science (DELTAS) Africa Initiative, Grand Challenges Africa (GC Africa) and the Good financial Grant Practice (GFGP) programme.

The AESA is a funding platform meant to foster sustainable development of research capability and promotion of scientific excellence through open calls for proposals with a transparent review process. AESA was created in partnership with the New Partnership for Africa's Development (NEPAD) Agency and with the support of the Bill & Melinda Gates foundation, the Wellcome Trust and the UK Department for international Development. DELTAS Africa awarded big grants to leaders of scientific research in Africa in such diverse fields as mental health, tuberculosis and HIV. The GC Africa, which addresses Africa's developmental challenges, complements the global success of



Grand Challenges in India, Brazil, South Africa and Canada. The GFGP reduces costs for funders and provides increased assurance that their funding is being used as intended. I commend to you the articles by AAS Senior Adviser Prof Kevin Marsh and AESA Director Dr Tom Kariuki in this report.

Another unprecedented activity was the unveiling of an enlarged replica of the 22,000 years old Ishango bone believed to be the oldest known record of mathematics in the world.

Others were the first bilateral AAS-KAST (Korean Academy of Science and Technology) symposium which took place in Nairobi and the first Pan African Science Olympiad, which took place in Abuja, Nigeria.

In the direction of forming partnerships and collaborating with other academies, the first AAS-KAST (Korean Academy of Science and Technology) held a symposium on Recent advances in biosciences and biotechnology for socio-economic development, in Nairobi, Kenya, on 6-7 July 2015. The symposium, which takes place in alternate years in Nairobi and Seoul is an important aspect of the AAS-KAST MoU where each Academy contributes five speakers.

I am happy to report that the AAS African Union Commission memorandum of understanding is ready and awaiting signature. The AAS is a strategic partner with several AU outfits, such as the NEPAD Agency with which we have already signed an MoU.

The Climate Impact Research Capacity and leadership Enhancement (CIRLCE) programme continued to make progress in 2015. The CIRLCE Visiting Fellows who do research in various host institutions in Africa while working under senior researchers have been doing very well and publishing their research in good journals. Indeed out of the 119 articles submitted to peer reviewed journals by 29 Visiting Fellows in 2015, 49 of them were already accepted for publication by the end of the year.

The capacity building workshops on Cell Biology and Regenerative Medicine organised research visits for seven of the early career scholars /mentees in laboratories in India, Brazil, South Africa and they are all reported to have done well.

The AAS' GC created four Commissions in 2014—the Commission on Science Education, the Commission on Pan-African Science Olympiads, the Commission on African Scientific Heritage, and the Commission on Women in Science—to popularise science and improve the visibility of the AAS on the continent. I am happy to report that the first AAS Pan African Science Olympiads took place in Nigeria in August 2015 at no cost to the AAS—thanks to the Nigerian Federal Ministry of Education and the National Mathematical Centre in Abuja.

It is now my pleasure to congratulate all new AAS Fellows elected in 2015. We are optimistic that they will do their utmost to help the AAS achieve its vision. I also congratulate those AAS Fellows who were honoured or received special awards in 2015—including Professors Ameenah Gurib-Fakim, Salim Abdool Karim, Ben-Erik van Wyk, Abdel-Shafy Fahmy Obada, Zeyau Kahn, Shem Wandiga, Anthony Youdeowei, Berhanu Abegaz and Maurice Tchuenta.

Aderemi Kuku

About the AAS

The African Academy of Sciences (AAS) is a pan-African organisation headquartered in Nairobi, Kenya, which aims to drive sustainable development in Africa through science technology and innovation. The AAS utilises its membership pool which consists of a community of excellent scientists to engage with governments and policy makers on the continent. The membership comprises individuals who have reached the highest level of excellence in their field of expertise and have made contributions to the advancement of the field on the continent.

To date AAS has recognised 330 AAS Fellows and Associate and Honorary Fellows who are proven science, technology and innovation leaders, policy advisors and thinkers most of whom live and work throughout the continent.

The activities of the AAS are broadly categorised into Recognising Excellence through the election of scientists into AAS Membership as Fellows/Associate Fellows and Affiliates (a programme to mentor young professionals into world class research leaders), and Awarding

Prizes; Providing think tank services for shaping the continent's strategies and policies and Programmatic activities.

The AAS is the only continental academy in Africa enjoying the support and recognition of NEPAD and the African Union as well as several governments and major international partners. These bodies also recognise the think-tank functions of the Academy and its increasing role in setting the research agenda for the future development of the continent.

The AAS is implementing programmes in partnership with pan African and international organisations. In 2015, the AAS launched the Alliance for Accelerating Excellence in Science in Africa, a platform created in collaboration with the New Partnership for Africa's (NEPAD) Agency. AESA is an agenda setting and funding platform to support the development of Africa's research leadership and promote scientific excellence and innovation to overcome some of Africa's developmental challenges.

Governance

The AAS is governed by:

- A General Assembly, that consists of AAS Fellows and meets regularly to hear from the Governing Council receive financial and activity reports and to approve the Academy's programmes;
- A Governing Council that consists of 14 officers elected by the General Assembly and meets twice a year to create and review the Academy's programmes, approve audited accounts and appoint members of the Management Committee;
- A Management Committee that consists of the President, the Secretary General, the Treasurer and the Executive Director;
- The Secretariat based in Nairobi, headed by an Executive Director.

AAS Governing Council (GC) members

No	Name	Position in the GC	Nationality
1	Aderemi Kuku	President	Nigeria
2	Georges-Ivo Ekosse	Secretary General	Cameroon
3	Mahmoud Abdel-Aty	V/ President, N. Africa	Egypt
4	Burton L. M. Mwamila	V/ President, E. Africa	Tanzania
5	Vincent P. K. Titanji	V/ President, C. Africa	Cameroon
6	Robert T. Guiguemdé	V/ President, W. Africa	Burkina Faso
7	Quarraisha Abdool Karim	V/President, S. Africa	South Africa
8	Ameenah Gurib-Fakim	Reg/Rep, E. Africa	Mauritius
9	Richard T. Awuah	Reg/Rep, W. Africa	Ghana
10	Chaibi Thameur	Reg/Rep, N. Africa	Tunisia
11	Boitumelo V. Kgarebe	Reg/Rep, S. Africa	South Africa
12	Silou Thomas	Reg/Rep Central Africa	Republic of the Congo
13	Ahmadou L. Ndiaye	Immediate Past President	Senegal
14	Berhanu M. Abegaz	Executive Director (ex-officio member)	Ethiopia

A legacy of driving scientific development

Berhanu Abegaz, AAS Executive Director



2015 was a momentous year for the African Academy of Sciences. Among the highlights was the launch of AESA, an agenda setting and funding platform set up by the AAS, the NEPAD Agency and three global partners (the UK Department for International Development (DFID), the Bill & Melinda Gates Foundation and the Wellcome Trust). AESA was also endorsed by the African Union Summit of January 2015. Three major science, technology and innovation programmes are operating under AESA with dedicated programme managers already in place. Dr Tom Kariuki, a leading biomedical scientist, an AAS Fellow and a former member of the Governing Council of AAS is leading AESA. I wish to pay a huge tribute to Tom and to the Senior Adviser, Prof Kevin Marsh who have worked tirelessly to lead the implementation of AESA and to realise what has been achieved so far. We are also very fortunate to have the unparalleled support of the President of Mauritius, HE Ameenah Gurib Fakim who presided over the colourful launch of the platform. This event received global coverage thanks to the efforts of our Communications Manager and back-up support from BMGF and Wellcome Trust.

The AAS also marked its 30th year anniversary in 2015 and it is proper that we take a moment to reflect upon the past three decades of its existence. I am inspired by reading the foundation documents of the Academy under the leadership of Prof Thomas R. Odhiambo. As founding president, he said the following statement in the closing exhortation to the task force that was created to set up and launch the Academy on 10 December 1985:

... "It is vitally important for the African scientific community to take initiative in this crucial matter so that we can begin to create the geopolitical climate in which science and technology can flourish and where the scientific community can begin to play its destiny in this continent which for a thousand years has seemingly lost its soul and direction."

The programmes that the AAS has implemented in the past and presently are geared towards contributing to shaping the destiny of science and the continent. The AAS is supporting the training of scientists through programmes under AESA like DELTAS Africa, CIRLCE and the Cell Biology and Regenerative Medicine initiative where we are helping early career and senior scientists to develop their ideas and provide research that can be used for policymaking. By empowering scientists, the AAS is building a critical mass to produce research and innovation to overcome some of the continent's developmental challenges and ensure that Africa contributes its own solutions to its own problems. Indeed, the AAS is building this critical mass in climate change, health and areas critical to Africa.

It is also interesting to note the mentorship role of the TWAS President during the formative years of AAS. Prof Mohammad Abdus Salam (Nobel laureate in Physics and founder of ICTP) had this to say at the inaugural meeting of AAS:

.....the African Academy of Sciences is very dear to us. It was initiated at the Third World Academy meeting in July 1985, and its foundation meeting was held at our Headquarters in December 1985. As a humble token, we have placed and will continue to place \$50,000 in support of the African Academy annually.

No wonder then it was Prof Mohamed Hassan who took over as the President of AAS (1999-2011) after Prof Odhiambo, concurrent with his responsibility as the Executive Director of TWAS. Prof Hassan wrote a beautiful narrative of his reflections during the 25th Anniversary

celebrations of AAS. He paid tribute to the former President of Nigeria H.E Olusegun Obasanjo who in 2005 decided to help the Academy by contributing US\$5million to the Academy's Endowment Fund. This growing Endowment now together with the assets (estate, building, etc.) has grown to US\$8.3 million. This action of H.E. Obasanjo is a realisation of the hopes and aspiration of Prof Odhiambo who had written in the first annual report of the Academy as follows:

Our main desire is that we become increasingly self-reliant in what we do, getting more support from our own people – our people are the mountains on which we will climb to see the horizon beyond, the horizon beyond which Africa should develop into a healthier, happier and more dignified continent.

I feel a sense of pride and gratification with the present state of the Academy. The last few years have seen a huge increase not only in the number of Fellowships but also their achievements. There is also a similar increase in number and quality of staff at the Secretariat. We wanted our Strategic Plan 2013-2018, to be one that would position AAS for better impact in Africa. In looking at where we are, I can say we are indeed poised to do just that.

Our experience of working with some of the key global donors, in the last two years has also taught us the need to ensure that we develop key policies that ensure good governance. The current GC is particularly aware of this and has raised the need to re-examine our constitution to ensure that we follow good corporate governance practices. In the process of doing so, we are also advised that we align our constitution to a prototype issued by the Kenya Government Bureau for coordination of NGOs. We now have an Audit and Risk Committee which meets regularly to review various reports of the Academy and advises the GC on actions to be taken.

I want to thank each and every one of my staff for working hard and for supporting me to fulfil my duties at AAS. Let me close by wishing everyone a highly successful 2016.

Putting science at the core of Africa's development

Kevin Marsh, Senior Advisor for the AAS



For me the last 18 months have been among the most exciting in a scientific career involving more than 30 years living and working in research in Africa. In 1981 I was an enthusiastic but naïve young research fellow at the MRC laboratories in the Gambia, trying to understand how children become immune to malaria. It was a time of intense excitement in the malaria world and many felt that a vaccine was just around the corner (it wasn't, of course). As a result, I ended up visiting a number of top malaria labs in the USA. Apart from the intellectual excitement, something that really struck me was the almost complete absence of African voices and researchers in discussions which had massive implications for Africa. The reasons were not hard to understand, at that time there were hardly any facilities in Africa to support the kind of sophisticated science which underpinned the research. This struck me as not only unfair but also incredibly inefficient- how could there be hopes of solutions to the challenges facing Africa if African researchers were not fundamentally involved? This undoubtedly was a major influence

on why I ended up working for 25 years with a wonderful group of colleagues in Kenya to establish one of Africa's leading research programmes. Apart from the science, the greatest buzz from this work came from the part we played in building both the infrastructure and leadership to contribute to the growing vibrant research culture in Kenya and in neighbouring countries.

In 2014, having decided that the time had come to step down from directing the programme, I was lucky enough to be asked by our major funder, the Wellcome Trust, to spend some time looking at their strategy for supporting the development of African research. I am not sure that I seriously believed that my proposal – that the best way to build research capacity would be to move the centre of gravity to Africa – would be enthusiastically received but that's exactly what the Wellcome Trust encouraged and as a result I ended up in May 2014 sitting in the AAS discussing these ideas with Berhanu Abegaz and Tom Kariuki. Sometimes one is lucky to find people who totally share a vision of what is possible and from

that moment everything went onto fast forward. Within months we had established partnerships with three major funders, the Wellcome Trust, the Bill and Melinda Gates Foundation and DFID, together with the NEPAD Agency, and the result was the formation by the end of that year of AESA, a new platform to support the development of high quality research in Africa. The pace continued through 2015 with the building of a fantastic team and the establishment of all the initiatives covered in this report. Only time will tell if all the work on the immunology of malaria proves useful- but the one thing for sure is that my involvement in establishing AESA has been one of the most exciting and rewarding experiences in my career.

Developing Africa's science leadership through AESA

Tom Kariuki, AESA Director



It has been a year since I became the AESA Director and what an incredible personal and corporate journey it has been. As I reflect on the achievements to date, it is also important to share the vision for AESA.

The creation of AESA in 2014 and its official launch in September 2015 is a story that is intertwined with that of our beautiful continent and the narrative of a rising Africa. My many years in research and institutional management prepared me for my new role, but they did not quite prepare me for the headlong dive into the world of global funders. In my previous job as a biomedical scientist and leader of a preclinical research facility, I was literally and figuratively on the 'receiving end' of donor funds, conditions, reporting requirements, negotiations for supplements and no cost extensions for more than two decades. Having created AESA as an agenda setting and funding platform, the shoe is now on the other foot, and I now have to dispense the same narrative and funders' ethos to my old laboratory bench comrades, and hope they will not feel talked down to and estranged like I would occasionally feel when I dealt with funders. Certainly our unique approach of building AESA as the 'go to' one-stop shop for designing, managing and implementing global partnership programmes, is an

opportunity to define a new era in partnerships, which can positively impact funder-recipient relationships. Shifting the management of international programmes to AESA will also help to ensure that Africa sets its own research agenda and encourage governments to fund research. The first year has been an enjoyable venture. Our AESA guiding philosophy is to focus on people, their places of work and the programmes they implement by partnering with African and international organisations to support them. But it is people who matter the most. Attracting the right people to AESA is an achievement that I am most proud of. The robust recruitment policies of the AAS have attracted a group of highly talented individuals who bridge all kinds of barriers – gender diversity, culture, language, geography, religion and race - a melting pot of the best from Africa and a microcosm of what a truly pan-African set up should look like.

I can tell you about our grand vision for science in Africa and back that up with the dismal science statistics of our continent but the data is on our website and various other sources. What I can share with you is what really drives me to do this job, to get up every morning and make the 50 minutes' drive from my house to our serene offices in Karen, a suburb in Nairobi. I want to inspire young African scientists to take up careers in sciences. I want to promote excellence and science leadership on the continent and to produce a critical mass of scientists, fully entrenched in Africa and solving the myriad of health and developmental challenges on the continent.

That Africa must use science, technology and innovation as the key driver for socio-economic development is a proven model of success. In the rural enclave where

I grew up in central Kenya, there have been many changes over the last few decades brought about by a roll out of conventional technologies and new innovations including electricity, running water and mobile connectivity. This was missing from the majority of homesteads during my childhood. Africa has made progress but millions of its people still do not have access to these basic amenities, (and the roads in my village are still not paved!). Education, the greatest gift that a child growing up in Africa can receive, is still unattainable for many. Women still die when giving birth and many children don't live to celebrate their fifth birthday. Some of the greatest challenges of our time are still ravaging the continent today including age old neglected diseases and major killers such as HIV, TB and Malaria and new challenges such as Ebola, and a growing epidemic of non-communicable diseases.

Our vision at AESA is to work in local and global partnerships to make science and research an attractive and recognised career option in Africa so we can train scientists who will not only stay on the continent but also provide leadership in addressing these local challenges. My own experiences tells me that this is a vision and mission that is within our grasp.

AAS Programmes

The Alliance for Accelerating Excellence in Science in Africa (AESA)

The Alliance for Accelerating Excellence in Science in Africa (AESA) is a platform that aims to impact development challenges in Africa by fostering the long-term sustainable development of science excellence, research leadership and innovation in Africa. AESA was established by the African Academy of Sciences (AAS) and the New Partnership for Africa's Development (NEPAD) Agency with support from three global partners: The Wellcome Trust, the Bill & Melinda Gates Foundation (BMGF), and the UK Department for International Development (DFID). In January 2015, the African Union heads of state endorsed the establishment of AESA, whose goals are in line with the Science Technology and Innovation Strategy for Africa (STISA 2024) - the African Union's blueprint for developing STI and part of the continent's long-term Agenda 2063 strategy.

AESA's mission is focused on supporting **people, places, and programmes**, which translates to supporting the best minds in Africa, working in conducive research environments, to implement programmes that produce quality, relevant data, and innovations that have the potential to impact health and developmental challenges on the continent and globally.

There are now four programmes that fall under AESA, two of which –Grand Challenges Africa and the Developing Excellence in Leadership, Training and Science– were launched at the AESA ceremony on 10 September.

- **Grand Challenges Africa (GC Africa)**, a scheme aimed at inspiring innovation to address developmental problems in Africa is expected to be fully operational in 2016. Grand Challenges Africa focuses on supporting the nearly 400 existing Grand Challenges grantees in Africa and will develop, launch and manage Africa-specific Grand Challenges targeted to the development challenges preventing African countries from reaching the Sustainable Development Goals.
- **Developing Excellence in Leadership, Training and Science (DELTAS Africa) Initiative**, a scheme initiated by the Wellcome trust in partnership with AESA and other partners, to support the Africa-led development of world class researchers and research leaders in Africa over an initial five-year period (2015-2020) has given out almost US\$100 million in grants.
- **Good Financial Grant Practice (GFGP)**, which is developing an internationally accepted standard for good financial grant practice, an assessment tool to measure performance against the standard, and to support training and future management of the GFGP certification, was approved by the AAS' General Council.
- **The Climate Impacts Research Capacity and Leadership Enhancement (CIRCLE)** is a partnership between the AAS and the UK-based Association of Commonwealth Universities offering a 100 fellowships to 40 post-masters and 60 postdoctoral researchers to spend a year in institutions outside their own studying the impact of climate change on the continent. The UK Department for International Development has provided £4.85 million for this initiative, which gave out 63 Fellowships when it took off in 2015.

Other AAS initiatives

As part of the **STEM (Science, Technology, Engineering and Mathematics)**, a strategic area of focus outlined in the Strategic Plan of the AAS (2013-2018), the AAS is implementing the:

- **Science Equipment Policy** is an initiative to promote the creation of policies that will make it easier for institutions to procure, install, use, service, maintain and dispose of equipment based on their research needs. The International Foundation of Science and the African Academy of Sciences are implementing the project to find solutions on how to effectively provide scientific equipment for universities and research institutions in Africa. Through the support of the AU's Human Resources, Science and Technology department, the partners hope to scale up the project to the rest of the continent.
- **Capacity Building through Mentoring African Scientists in Cell Biology and Regenerative Medicine Research** mentors young scientists and builds capacity in cell biology and regenerative medicine in Africa. The InterAcademy Panel is funding the initiative, which recruited seven mentees in 2015.

The Alliance for Accelerating Excellence in Science in Africa (AESA)

Since the 24th African Union Heads of State Summit (see pictured: Resolution 10 of the Declarations, Decisions and Resolutions of the January 2015 summit) endorsed AESA, the AAS and the NEPAD Agency worked hard in the year to establish and operationalise the funding platform. The AAS recruited 16 staff members to join the AESA team and steer the implementation and success of the programme. Key among the new recruits was the AESA Director Thomas Kariuki, a distinguished and award-winning immunologist and Fellow of the African Academy of Sciences.

Other actions taken to operationalise AESA include a three-way MoU signed in February between the Wellcome Trust, the UK's Department for International Development (DFID) and the Bill & Melinda Gates Foundation setting out the basis on which the funders collaborate in supporting the platform, maintain oversight, and provide funding.

AESA was launched through a series of events that included a media breakfast, a panel discussion and a launch ceremony on 10 September 2015 in Nairobi, Kenya.

Her Excellency Prof Ameenah Gurib-Fakim (President of Mauritius) was the chief guest at the launch. She pledged to use her presidential platform to advocate for increased investment in science and technology in Africa.

There was high level representation from the government of Kenya, the African Union, major African and non-African scientific networks, African academic and research organisations, members of the diplomatic community, representatives of global organisations that support health sciences and development, and other AAS-AESA collaborators, funders and partners at the launch.



From left to right: Fredros Okumu, Head of Environmental Health and Ecological Sciences at Tanzania's Ifakara Health Institute; Aggrey Ambali, Head of NEPAD Science, Technology and Innovation Hub; AAS Executive Director Berhanu Abegaz; Mauritian President and AAS Fellow Ameenah Gurib-Fakim; Head of DFID East Africa Research Hub Julia Kemp; AAS Senior Advisor Kevin Marsh; Haddis Tadesse, Bill & Melinda Gates Foundation Senior-Level Government Relations and Development Professional; and George Ombako, Director of Research Management and Development at the Ministry of Education Science and Technology, Kenya.

10. ACCORDINGLY REQUESTS the NPCA in partnership with the African Academy of Sciences to establish and operationalize the Alliance for Accelerating Excellence in Science in Africa (AESA) as a platform to stimulate breakthrough innovations in health to improve the livelihoods of marginalized and stigmatized communities. **CALLS UPON** Member States, regional and global partners as well as private foundations to support the Alliance in order to strengthen health research and innovation in Africa.

Figure 1: Resolution 10 of the African Union Summit Declarations, Decisions and Resolutions of January 2015, Addis Ababa, Ethiopia.

Approximately 300 guests participated in the day-long event. There were also approximately 50 journalists from Africa and international media-houses present, which led to over 57 articles published on the launch.

Some key participants at the event pledged to mobilise support for AESA and for African science. These included:

- Kenya's former cabinet secretary for Education, Science and Technology, Prof Jacob Kaimenyi, who promised to advocate for provision of resources and privileges to AAS and its initiatives.
- Dr Christian Turner, the former UK ambassador to Kenya, who pledged provision of additional funding to the DELTAS Africa initiative through DFID.

In addition, AESA and partners announced the creation of DELTAS Africa and the GC Africa programmes at the launch.

Unveiling of the Ishango bone at the AESA launch



3D replica of the Ishango bone

At the AESA launch, the AAS unveiled an enlarged replica of the Ishango bone, a 22,000 year old animal bone discovered in Ishango in the Democratic Republic of the Congo, and believed to indicate the early use of mathematics on the continent. The 150 cm 2D replica was etched by a laser beam with its sub-surface

engraved with the words "Ishango bone". The AAS, the University of South Africa, the International Centre for Theoretical Physics, the International Organization for Chemistry in Development (IOCD) and the Museum of Natural Sciences collaborated to facilitate the creation of the replica, and its delivery from Brussels to Nairobi. The AAS also received 3D replicas of the bone, created within a 30cm long glass box. The replica is now displayed at the AAS where it is a permanent reminder of Africa's achievements in mathematics and serves as symbol of the continent's scientific excellence and its contribution to the knowledge economy. It serves as an inspiration to visitors to the Academy and young people of what is possible if Africa invests in science.

The AAS' online grant management system has been named after the Ishango. The Ishango Grant tracker, a grants management system, has also been developed to allow for online applications and reviews for AAS calls for proposals and nominations for AAS Fellows.

AAS Think Tank functions

AESA is drawing the expertise of its Fellows to generate and use evidence to help governments and regional bodies formulate evidence-based policies. To spearhead this, the AAS has established committees of experts in the six areas– climate change; health and wellbeing; STEM (science, technology, engineering and mathematics); water and sanitation; sustainable energy; food security and nutritional wellbeing that provide guidance and oversee the efforts of the Academy to promote evidence-based policymaking.

In 2015, the AAS created an 11-member Health and Wellbeing Committee, composed of scientists who have made significant contributions in the area of health and have distinguished themselves as world-class scientists in their respective areas of specialisation. The committee seeks to provide the evidence for making health policies on the continent. Its first port of call was to hold a meeting in September to discuss the health research priorities of the African Health Strategy 2015-2025 assigned as

one of the immediate tasks for AESA to be implemented in partnership with the NEPAD Agency. The development of the health research strategy is guided by Priority 2 of the African Union's Science, Technology and Innovation strategy for Africa 2024 (STISA 2024) titled *Prevention and Control of Diseases*.

Additionally, AESA constituted a nine-member Independent Scientific and Strategic Advisory Board (ISSAB) to provide advice regarding the progress of the AESA's scientific direction, strategy, operations and mission to the Director of AESA, Executive Director of the AAS and the funding partners on an *ad hoc* basis. The ISSAB will also evaluate AESA's activities, specifically the programme's contribution to scientific research capacity development in Africa and contribution to shaping Africa's science strategies.

The Good Financial Grant Practice Programme

The Good Financial Grant Practice (GFGP) is one of AESA's initiatives created in 2015 with significant input from the AAS Governing Council. This led to the articulation of the GFGP's mandate, which is to create a universally accepted standard of what constitutes "best practice" for the management of funds awarded to recipients.

With funding from the Wellcome Trust and the UK's Medical Research Council, the GFGP programme was established within AESA to develop a pan African standard for good grants management. The efforts made so far by AESA and stakeholders have led to the identification of common challenges facing funders and grantees. These include funders independently carrying out pre-award assessments, having different reporting requirements, and separately undertaking post project audits. Such activities resulted in recipients having multiple assessments, multiple audits, and

inconsistent requirements from funders. All of which puts additional strain on recipient institutions' finance functions which are typically under-funded and under-resourced.

The GFGP will implement a pre-award assessment tool that will be used by organisations who have been awarded grants to undertake an assessment of their financial capabilities. This will provide assurance to funding partners and host country authorities of their current financial capabilities and identify opportunities for capacity development.

This is intended to make African organisations even more attractive to funders and reduce the administrative burdens of having to undertake numerous separate due diligence reviews and annual audits demanded by a myriad of funders. Funders will, in turn, be assured that their funds are going to recipient organisations with certified capabilities to manage the grants.

After preparing and receiving approval of the proposal from the GC, the AAS presented the GFGP to the African Organisation for Standardisation (ARSO) General Assembly in Ethiopia in August, where it was adopted as a "new work item" and a partnership established between the AAS and ARSO.

The GFGP also generated interest from non-governmental organisations leading to a partnership with Mango, a UK-based charity focused on strengthening the financial management and accountability of NGOs around the world. Mango will support the GFGP by contributing their extensive experience and expertise in training and capacity building of NGO across Africa and the world. As a precursor to the partnership, Mango and GFGP partners held a seminar on good financial grant practice at the offices of the Wellcome Trust in London in October.



Participants at a two day workshop to develop a pan African standard for Good Financial Grant Practice (GFGP) in Nairobi, Kenya.

Grand Challenges Africa

To inspire innovation in Africa, AESA launched the Grand Challenges Africa initiative (GC Africa) in September 2015. The initiative aims to:

- Consolidate and improve on the gains made through Grand Challenges (GC) support to African scientists over the last decade.
- Undertake outreach and awareness campaigns to extend the reach of the Grand Challenges funding model.
- Define and set the agenda for future grand challenges in health programmes in Africa.

As part of efforts to operationalise the GC Africa initiative, the AAS successfully submitted a proposal to the Bill & Melinda Gates Foundation (BMGF) for US\$1.4 million to support AESA's engagement with the BMGF's partners in Africa and to convene grantees from the various Grand Challenges partners- USAID, BMGF and Grand Challenges Canada, in February 2016. AESA launched a closed call for a Proposal Development Workshop for Grand Challenges grantees in December as part of the grant.

Earlier in the year, AESA organised a Proposal Development Workshop in Addis Ababa, Ethiopia in July 2015 to help early and mid-career scientists improve their skills for writing proposals.

Twenty-eight scientists took part in the workshop with three of them having already won significant grants.

Through AESA, the AAS also conducted an online survey to solicit ideas on how to shape GC Africa. By December 2015 more than a third grantees had responded to the survey.

The Grand Challenges Innovation Network (GCAiN) was also launched in December 2015 with 41 grantees registering.

As GC Africa's mandate is to undertake awareness campaigns to extend the reach of the GC funding model, AESA participated in various meetings to drive more traffic from Africa to the AAS-AESA website and the Bill & Melinda Gates Foundation /Grand Challenges website; create more channels of communication with key constituencies; and inspire young and emerging African scientists to compete for GC Africa/ Grand Challenges Explorations funding opportunities when they are announced.

Key meetings included:

- The annual Grand Challenges Meeting in Beijing, China from the 17 -21 October 2015 where GC Africa was profiled. There were more than 800 attendees at this meeting, serving as a large forum with which to engage on AESA and GC Africa. The team from AAS, which

included Berhanu Abegaz, the Executive Director, AESA Director Tom Kariuki and GC Africa Programme Manager Evelyn Gitau held a successful roundtable discussion on GC Africa which solicited valuable feedback on how to proceed with GC Africa. The AAS GC Member and President of Mauritius, H.E Ameenah Gurib-Fakim also attended the meeting and promoted AESA by doing so.

- The Science Forum South Africa on 8-9 December 2015 where the AAS were invited to profile AESA as a flagship programme for African science at a session. President Gurib-Fakim spoke in a video during the side meeting where she reinforced her commitment to use her position as a member of the African Union Presidential Committee on Science, Technology and Innovation to champion AESA and women in science. The NEPAD Agency and the Southern African Development Community also participated in the session through Aggrey Ambali, the Head of the NEPAD Science, Technology and Innovation Hub and Thembinkosi Mhlongo, the SADC Deputy Executive Secretary for Regional Integration, respectively.

CASE STUDY

Researcher says she won first grant after participating in AESA's proposal development workshop



Pauline Bakibinga (right). Her project seeks to develop and demonstrate how a mobile phone application can be used to enable Community Health Volunteers to identify risks facing pregnant women, new mothers and newborns, and making timely and correct decisions on referral for cases that need intervention in Nairobi's slums

A Kenya-based health researcher says participating in AESA's Proposal Development Workshop helped her to win her first grant.

Dr Pauline Bakibinga, an Associate Research Scientist at the Nairobi-based African Population and Health Research Center (APHRC), says that she had submitted proposals during the two years of her postdoctoral fellowship at APHRC which had not won any funding.

She did not hesitate to apply when she heard that AESA was organising a workshop to train early career researchers to write proposals. The Uganda-born primary care physician and researcher was one of the 28 researchers to take part in the Proposal Development Workshop held in July 2015 in Ethiopia. There she learnt several useful tips for preparing proposals for funding.

"As a scientist you never take into account that your proposal could be reviewed by a wide range of people and so we get too technical. So I learnt that I need to use language that captures a wide range of audience for my proposal to catch the eye of a reviewer," she says.

Dr Bakibinga had been developing a proposal to the County Innovation Challenge Fund for Kenya (DFID funded) before the workshop. She used what she learnt to rewrite and repurpose her proposal leading to her winning her first grant worth £250,000 in October 2015. Her project seeks to develop and demonstrate how a mobile phone application can be used to enable

Community Health Volunteers to identify risks facing pregnant women, new mothers and newborns, and making timely and correct decisions on referral for cases that need intervention in Nairobi's slums. The Community Health Volunteers conduct routine home visits and sometimes find patients with illnesses they don't understand. By logging the symptoms into the application, they would be able to know what to do, either to manage the patient from home or refer them to the health centre.

"Most of these health workers have not gone beyond primary or secondary level education. They have to refer to a book to find out what it is, which is both time consuming and can make them look incompetent before their clients.

"With the mobile app, the health workers can fill in the symptoms and get a score which would indicate the next course of action. This would be an efficient way of working for them," the PhD graduate from the University of Bergen in Norway says.

Her stroke of luck continued after the AESA workshop with a second US\$10,000 that she won from her Alma Mater at the US' Brown University (Brown International Advanced Research Institute), to study Intimate Partner Violence among older persons aged 60 and above in Nairobi's Viwandani and Korogocho slums.

"Another lesson that I took from the workshop was the need to show that my proposal is responding to current problems and is innovative."

Developing Excellence in Leadership, Training and Science (DELTA Africa)

The AAS in collaboration with the Wellcome Trust and DFID implemented the following activities for the DELTA Africa initiative:

- The Wellcome Trust issued the call for proposals and complemented this with a webinar. The purpose of the webinar was to provide detailed information on the objectives of the DELTA Africa programme to potential applicants and to provide an interactive platform through which potential applications could address queries and obtain instant clarifications in order to increase the chances of receiving quality proposals.
- Over 145 preliminary applications were received in response to the DELTA Africa call and webinar. Thirty of these were invited to submit full applications for review. Of the 30, 18 applications were shortlisted by a review team.
- For the first time, the Wellcome Trust, together with AAS and AESA, hosted a DELTA Africa Committee meeting in Nairobi in May 2015 at the AAS premises. The meeting entailed intense interviews with programme directors and co-applicants from the 18 applications that had been shortlisted. The committee subsequently selected 11 “fundable” programmes although the funds available

at the time could support only seven programmes. High level discussions between AAS and funding partners succeeded in yielding additional funds for the four remaining programmes.

- A DELTA Africa programme inception meeting was also held in Nairobi in September, coinciding with the official launch of AESA. Five programme and finance staff from each of the initial seven funded programmes together with staff from both the Wellcome Trust and AAS/AESA attended the meeting. The meeting offered an opportunity to clearly articulate the objectives of the programme to the grantees and the expectations from the Wellcome Trust and AAS/AESA of how the programme should be implemented and reporting requirements. Participants also discussed monitoring and evaluation, culminating in the identification of common M&E indicators. It also provided a forum for participants from the various DELTA Africa-funded programmes to meet and interact with each other and to explore avenues for possible collaborations and exchange of ideas and resources.

Site visits to DELTA Africa funded programmes

A team of programme and finance staff drawn from the Wellcome Trust and the AAS/AESA conducted site visits to some of the institutions where the DELTA Africa programme directors are based. The site visits were to the University of Zimbabwe in Harare, the University of Science, Technology and Techniques in Bamako, Mali; the University of Cheikh Anta Diop in Dakar, Senegal and Centre Suisse de Recherche Scientifique in Abidjan, Cote D'Ivoire. These visits served to identify challenges faced by the grantees so as to develop solutions to ensure the successful implementation of the programmes, to build relationships with grantees and to canvass support of the programmes at institution's executive management level and the highest policy and political levels in the countries where these institutions were based.

The Wellcome Trust and AESA teams also sought and obtained institutional leadership commitments to support DELTA Africa from senior policy and political leaders. The team met Vice Chancellors, Rectors, Deans of relevant faculties, Directors of Research and Directors of Finance of the institutions visited. It also engaged ministers of health (Zimbabwe), science and technology (Mali), research and higher education (Cote d'Ivoire) and directors in the ministry of health (Senegal).



DELTA Africa grantees at the inception meeting held in Nairobi, Kenya, in September.

Climate Impacts Research Capacity and Leadership Enhancement

The CIRCLE Programme

The Climate Impact Research Capacity and Leadership Enhancement programme was approved in June 2014. It is an initiative funded by the Department of International Development to develop the skills and research output of early career African researchers in the field of climate change and its local impacts on development. The programme will run from 2014-2018 and will support three cohorts of CIRCLE Visiting Fellows (CVFs).

The three main objectives of the CIRCLE fellowship programme are:

1. To strengthen research capacity in sub-Saharan African research institutions to support early career researchers and develop a coordinated and strategic approach to climate change research;
2. To strengthen the capacity of African researchers to undertake research on climate change and its local impacts on development;
3. To strengthen the capacity of the AAS to set and implement research programmes based on credible commissioning and peer-review processes.

The programme is offering one year Fellowships to support research proposals on the impact of climate change in Africa, with up to 100 fellowships funded over three years. Fellowships are available for 40 post-masters and 60 post-PhD researchers. The fellowships are specifically targeted at early career African researchers nominated by their home institutions (universities, research institutions) in Africa and hosted by African universities and research institutions. Both home and host institutions will receive support and training to develop their institutional research capacity, with an emphasis on supporting early career researchers. Fifty percent of the fellowships are awarded to female candidates.

Cohort 1 CIRCLE Visiting Fellowships

In 2015, the CIRCLE Programme offered 34 early career researchers with fellowships to study impacts of climate change under five thematic areas:

1. Water;
2. Agriculture;
3. Energy;
4. Health and Livelihoods
5. Policy

These 34 CIRCLE Visiting Fellows (CVFs) undertook their one-year fellowship outside of their own home institutions. The cohort 1 CIRCLE Visiting Fellows (CVFs) were from 25 African "Home" institutions and undertook their fellowships in 13 African "Host" institutions. They were made up of 15 (44%) female and 19 (56%) males; 19 post-PhD CVFs (56%) and 15 (44%) post-Masters CVFs. Fifteen (15) out of the 34 CIRCLE Visiting Fellows (CVFs) spent their one-year fellowships in institutions that were also outside of their home countries.

Induction workshop

The first cohort of CIRCLE Visiting Fellows took part in an induction workshop, which was held in February 2015 at the AAS secretariat. The workshop focused mainly on how the CVFs could get the most out of their fellowship. The workshop included sessions on career planning; situating the current level of their research activity and skills as well as identifying training and development requirements to achieve further progression in their research career. They were also trained on scientific writing and publications.

Activities of CVFs at host institutions

At the host institutions, CVFs undertook their research under the supervision of a senior scientist/lecturer. The CVFs, their supervisors and the host institutions submitted quarterly reports to monitor the progress of the research, the key activities undertaken in the quarter, the satisfaction levels of supervisor and CVF, any changes or developments in the research proposal or work plan, conferences and publications and recommendations for the fellowship. Each CVF was also assigned a specialist advisor who guided them on the research quality of the work.

Circle Visiting Fellows

63

Number of CVFs awarded over 2 cohorts

60%

Post-PhD Fellowships awarded; 38/63

48%

Female CVF over the 2 cohorts; 30/63

37%

Post-PhD CVFs who are females; 14/38

64%

Post-Masters CVFs who are females; 16/25

Scientific meeting attendance and training programmes by cohort 1 CVFs

CVFs were also given financial support to attend both national and international scientific meetings to present their work and to network with other scientists from across the globe.

Thirty-three (33) out of the 34 cohort 1 CVFs attended 114 conferences/seminars during the fellowship period. CIRCLE financially supported CVFs to attend 44 of these meetings. Findings from CIRCLE-funded research were presented at 58 scientific meetings by 30 CVFs.

CVFs who identified specific training needs were also supported by the programme to attend these trainings to improve their research capacity. Thirty-one CVFs attended 74 training programmes. CIRCLE's financial support for these trainings covered 44 CVFs; 31 full support and 13 partial support.

Research output of cohort 1 CVFs

CIRCLE Visiting Fellows are expected to publish at least one paper from their CIRCLE-funded research in an international peer-reviewed journal.

A total of 119 articles were submitted to peer-reviewed journals by 29 CVFs in during the one-fellowship period; 5 CVFs were yet to submit any article as of close of the year. Out of the 119, 49 had been accepted by journals for publication at the end of

2015. Not all these articles submitted for publication were from the CIRCLE-funded research but the one year away from other responsibilities in their home institutions to focus on research helped them to work on other data they already had.

Articles submitted to international peer reviewed journals based on CIRCLE-funded research were 45, from 22 CVFs out of which 12 had been accepted by close of the year 2015.

Grant/Funding Applications

CIRCLE supports CVFs to identify and apply for more funding towards their research career after the expiration of CIRCLE funding. AAS makes available to the CVFs periodic updates of funding opportunities and request for proposals (RfPs) and encourage CVFs to apply. In the year 2015, 25 CVFs submitted 54 applications for funding to various calls and 17 of who were successful.

CASE STUDY

CIRCLE Fellow wins grants from South Africa's National Research Foundation



Amon Taruvunga

A CIRCLE fellow won R2,2 million in grants from South Africa's grant making foundation, the National Research Foundation (NRF) in 2015 enabling him to empower indigenous communities to improve their strategies for tackling climate change.

The grants that Amon Taruvunga, a lecturer from South Africa's University of Fort Hare, won from the NRF were from proposals inspired by his CIRCLE funded research.

In 2015 CIRCLE funded Taruvunga to research how small scale farmers are adapting to climate change. He was one of the 34 fellows who were recruited in 2015 through CIRCLE to spend a year in another African institution outside their own studying the impact of climate change. Taruvunga spent his year at the University of Cape Town where his research took him to six district municipalities in the Eastern Cape province of South Africa. There he found that farmers were using various strategies to adapt including planting drought tolerant indigenous food crops like grain sorghum (*Sorghum bicolor*) and switching from sheep to local indigenous breeds of cattle and chicken

rearing, which are more tolerant to water stress. In Amathole, one of the six district municipalities where he did his research, he found that due to climate change farmers were switching to beekeeping a rational move given that honey bees require optimum foraging temperatures between 16°C – 32°C, and supportive vegetation biomes with good floral diversity.

The farmers were, however, using traditional ways of bee keeping, (traditional log hives, no protective clothing, harvesting by smoking the bees) which curtailed their production. The challenges the farmers faced in improving their production gave Taruvunga an idea to train the farmers in commercial beekeeping. He, however, needed money to conduct the training. Already experienced in grant application from his previous projects, CIRCLE enable the Zimbabwe-born researcher to hone his grant application skills leading him to successfully apply for a R100,000 training grant from the Agricultural and Rural Development Research Institute. The funding managed to establish 3 pilot apiaries each with 15 trained unemployed youth, 30 Kenyan Top Bar (KTB) hives, five protective clothing and 3 smokers. The NRF also gave him a R650,000 grant to map commercial beekeeping areas in the Amathole district municipality of the Eastern Cape province given that not all areas may support commercial beekeeping.

Using the funding he is targeting to

(a) Study the potential of various local municipalities within Amathole to commercially support beekeeping,

(b) Conduct a baseline survey on the status of beekeeping focusing on perceptions, gender dynamics, current practices, awareness and needs assessment analysis.

(c) Estimate the potential to find local, regional and international product markets for the farmers.

Taruvunga is supporting two masters students to study how his programme will impact the farmers in Amathole and to help them adding value to their honey to maximise profits from the same grant.

His other NRF grant in 2015 worth R30, 000 came from a proposal to form the Southern Africa Climate Change and Biodiversity Research Forum. The forum drew collaborators from Namibia, South Africa and Zimbabwe and has prompted another collaborative research project to develop an app that will provide mobile alerts for veld fires in rural areas of Zimbabwe. The prototype entitled, "Integrated mobile veld fire detection, monitoring and sharing App" has been tested at lab level showing impressive results. The forum is currently seeking for funding to pilot test the App at field level and up-scaling targeting southern African countries.

He also won R1.485 million from the NRF in December to understand indigenous knowledge and technological innovations on livelihood based handcrafts among rural women. In the process, Taruvunga and his team hope to develop a local IK and technological innovations database placed in a mobile cloud application for sharing and preservation. The goal is to enable communities to learn how to cope with climate change from each other.

The Cell Biology and Regenerative Medicine Initiative

The AAS' CBRM project provided an opportunity for young African scientists to be mentored by experts in stem cell science. The project idea, which was conceived on the side lines of the 23rd TWAS General Meeting in Tianjin, China in September 2012, has realised the following objectives: share information on the potential of cell therapy/regenerative medicine to address global health concerns in general and those that are specifically relevant to Africa; create a mentoring forum for young scientists by organising short-term research visits to established laboratories; provide "hands-on" the basic techniques of stem cell science and technology and demonstrate the effectiveness of international science cooperation, particularly South to South collaboration.



CBRM mentees during practical laboratory demonstrations at the AAS Workshop on "Training and Mentoring African Scientists in Stem Cell and Regenerative Medicine Research"

In 2015 the AAS organised short-term research visits for seven early career African scholars/mentees to receive training in laboratories of experts in India, Brazil and South Africa. The placement of the mentees to specialised laboratories where they would be mentored and

trained was based on (i) mentees' areas of research interest and (ii) mentor-mentee interaction during the workshop.

Short-Term Research Visits to Mentors' Laboratories in Africa, Asia and South America

Mentee/Institution & [Local Mentor]	Host Mentor & Institution	Duration of Research Visit (2015)
INDIA		
Farisai Chidzwindo, University of Zimbabwe, Harare, Zimbabwe [Prof. IdahSithole-Niang]	Dr. Anjali Shiras, National Centre for Cell Sciences (NCCS), Pune, India	5 - 23January
Jafer Kedir Ababora, Jimma University College of Public Health and Medical Sciences, Jimma, Ethiopia [Prof. Kora Tushune]	Prof. Dorairajan Balasubramanian and Dr. VirenderSangwan, LV Prasad Eye Institute, Hyderabad India	25 January -10 February
BRAZIL		
Denis A. Russia, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania [Prof. Sylvia Kaaya]	Prof. Vivaldo Moura-Neto, Prof. Fabio Almeida Mendes and Prof. Jose Garcia Abreu, The Institute of Biomedical Sciences of the Federal University of Rio de Janeiro , Brazil	4 -22 May
Lucy Macharia, KAVI-Institute of Clinical Research, College of Health Sciences, University of Nairobi, Kenya [Dr. Marianne Mureithi]	Prof. Vivaldo Moura-Neto, Prof. Fabio Almeida Mendes and Prof. Jose Garcia Abreu, The Institute of Biomedical Sciences of the Federal University of Rio de Janeiro, Brazil	4 - 22 May
Caroline W. Muriithi, Institute of Primate Research, Nairobi, Kenya [Dr. AtungaNyachieo]	Prof. Vivaldo Moura-Neto, Prof. Fabio Almeida Mendes and Prof. Jose Garcia Abreu, The Institute of Biomedical Sciences of the Federal University of Rio de Janeiro, Brazil	1 - 20 September
SOUTH AFRICA		
Dorcas Wachira, Kenya Medical Research Institute (KEMRI) [Dr. Kimani Gachuhi]	Prof. Susan Kidson and Prof. Michael Pepper, Institute for Cellular and Molecular Medicine at the University of Pretoria in South Africa.	18-13June
Ms. Clare Njoki Kimani, Institute of Primate Research, Nairobi, Kenya [Dr. AtungaNyachieo]	Dr. VenantTchokonte-Nana, Islet Research Laboratory, Anatomy and Histology, Faculty Of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa	1 August – 30 September

CASE STUDY

Kenyan Masters graduate finds a PhD scholarship through CBRM



Lucy Macharia

An African Academy of Sciences mentorship programme enabled Lucy Macharia, a masters graduate from Kenya's University of Nairobi, to find a PhD scholarship and carve her career path in 2015.

Macharia's masters supervisor Dr Marianne Mureithi, a lecturer at University of Nairobi, encouraged her to enrol for the workshop on Training and Mentoring African Scientists in Stem Cell and Regenerative Medicine Research that the AAS organised in 2014.

The workshop convinced her that this field not only offers an opportunity for contributing to reducing Africa's disease burden but also for growing her career.

Her masters in medical microbiology focused on cancer research. Regenerative medicine and stem cell biology was a completely new field of research to her but in it she found a home and a path to carve her career.

The AAS organised the workshop as part of the Cell Biology and Regenerative Medicine Research (CBRM), an initiative to mentor young scientists in cell biology and regenerative medicine in Africa,

which it is implementing with the Kenya National Academy of Sciences and the Indian National Science Academy.

Macharia was paired with mentors, Professors Vivaldo Moura-Neto, who works at Brazil's Instituto Estadual do Cerebro Paulo Niemeyer, Jose Garcia Abreu and Fabio Almeida Mendes from the Federal University of Rio de Janeiro's Institute of Biomedical Sciences. The initiative also paid for her to travel to the University of Rio de Janeiro in Brazil to spend a month at her mentors' laboratory.

It is in this programme that she learnt of the opportunities that stem cell research provides in treating a myriad of diseases including cancer. This in turn led her to develop a PhD proposal with the help of Prof Moura-Neto on the study of tumoral stem cells from glioblastoma and medulloblastoma and their contributions to diagnostics and therapy. Glioblastoma multiform is the most common and aggressive brain tumour while medulloblastoma, a brain tumour common among children, is difficult to detect and can lead to a delayed diagnosis. This study focuses on using stem cells to

improve the diagnosis and survival rates of brain cancer patients.

"Non communicable diseases are on the rise in Africa and I hope that research like mine will assist in reducing their burden," she says.

The CBRM initiative not only opened Macharia's eyes to a new career field but provided opportunities to network that opened doors for her PhD studies. Her mentor in Brazil helped her to develop and apply for a PhD scholarship at the University of Rio de Janeiro where she began her studies in August 2015.

Macharia plans to return to Kenya when she complete her studies in four years and to join her Kenyan alma mater and start her own stem cell research group so she can, in turn, mentor other young researchers.

"I didn't know this before I enrolled for the AAS workshop but a career in stem cells is my destiny. I am grateful to the AAS for providing a platform for me and other young scientists to define our career paths," Macharia says.

The Science Policy Equipment Initiative

The challenges that African institutions face with equipment impact on academics' ability to do their work. Equipment is either not installed as it sits in storage while institutions build facilities to house it, or is broken down or obsolete. Institutions also do not allocate money to maintain the equipment or lack the capacity to use it or do not have an inventory of their assets. Procurement procedures in some institutions mean that it can take too much time to acquire the equipment, leading to research projects being delayed.

In response, the International Foundation of Science (IFS) and the African Academy of Sciences (AAS) are implementing the Science Equipment Policy initiative, which has been running since 2012. To date, the project has conducted

studies in Ethiopia, Ghana and Kenya on procurement processes within African institutions and to review science equipment policies. These studies recommend for institutions to develop equipment procurement strategies based on needs of their scientists and their organisations' priority research areas and to establish committees to develop policies and procedures on all disposal matters, including timing, safety and use of proceeds in line with government directives and international safe disposal protocols. Governments are encouraged to curtail bureaucracies and delays in the clearance and sourcing of equipment.

In 2015 the work of the project continued with the partners holding a consultative workshop on 20 to 21 August to discuss how to promote

the creation of policies that will make it easier for institutions to procure, install, use, service, maintain and dispose of equipment based on their research needs.

The consultative workshop held in August 2015 provided a platform for institutions that conducted studies on science equipment in Ethiopia, Ghana and Kenya to share their experiences on how they have used the outcome of their studies to lobby for better policymaking. The institutions have also committed to lobby local institutions and governments to improve policies on customs, tax exemptions and allocate budgets to maintain equipment. The ultimate goal is to ensure the effective implementation of research programmes.



Participants at the Consultative Workshop on Science Equipment Policy in Nairobi, Kenya, on 21-22 August

Communication

Highlighting the benefits of science is crucial to garner political and public support and increase research uptake. This is a challenge the AAS is taking seriously. As the Academy seeks to garner policymakers' support for AESA and science, it is important to improve communication with these stakeholders. Together with highlighting the work of scientists who benefit from its projects, the AAS is also working to improve its visibility to ensure that its Fellows, partners and the continent are kept informed of AAS' activities through its mailing list. As a thought leader, the AAS draws expertise from its Fellows that can benefit policymakers and international partners seeking to promote evidence-based policymaking and to develop science in Africa.

Reaching out to the media

The media is a crucial stakeholder as it reaches a wider audience. The challenge in 2015 was to continue building relationships with the media to ensure improved coverage of science.

As part of efforts to proactively engage the media, in 2015 the AAS and its partners at the Bill & Melinda Gates Foundation sponsored 10 journalists from across Africa to attend the AESA launch. The Academy and its partners also hosted a breakfast for the AESA launch attended by over 70 people, the bulk of whom were Kenya-based journalists and international correspondents based in Nairobi. As a result, the AAS witnessed improved media coverage with over 57 articles by media publications across the globe on the AESA launch alone.

Media highlights from the launch included:

- Articles in three global top-tier outlets: BBC News, the Guardian, and Reuters



- Original articles from media outlets in ten African countries in addition to pan-African outlets with a more targeted scientific leadership such as Research Africa, and SciDev.Net.
- Two op-eds in the Guardian authored by HE Ameenah Gurib-Fakim and Tom Kariuki respectively, urging African governments to increase their investments in African R&D.
- Social media complemented traditional media to reach a broader audience, with more than 1300 tweets generating more than 4.4 million impressions.

Internal communication

In 2015 the Academy set out to upgrade its communication tools by introducing a brand manual and a style guide in 2015 to govern every aspect of communication. The manual and the style guide also serve as a guide for consultant designers who are creating design tools for AAS communications.

The AAS also developed and printed brochures for the Academy, AESA and CIRCLE.

A new website for the AAS

The Academy also launched a new website in November 2015 as part of efforts to improve its communication tools and include continent on new programmes. The website, whose domain changed from www.aasciences.org to www.aasciences.ac.ke, introduces:

- New sections that include field stories on some of recipients on AAS grants and beneficiaries of its training programmes.
- Videos to help the AAS tell compelling stories. The videos include Mauritian President Ameenah Gurib-Fakim's speech at the AESA launch encouraging African governments to invest in support and that of President Gurib-Fakim speaking of her support of AESA. The AAS also documented the AESA launch in a feature film that gives greater detail of what the programme is about and what it seeks to achieve.
- Content on its new programmes, some of which are being implemented as partnerships with other partners, namely the Good Financial Grants Practice, Grand Challenges Africa and DELTAS Africa.
- Pesapal, which will allow AAS Fellows to pay their yearly membership online using visa or mastercards and M-Pesa (a mobile payment system used in Kenya).

Science*Policy*Africa

In 2015, the AAS produced four issues of its flagship newsletter. This is published quarterly in March, June, September and December.

Activities of the Governing Council

The Governing Council met twice in 2015 on 9-10 February and 29-30 October at the AAS headquarters in Nairobi, Kenya, to review the reports of the Endowment Fund and AAS programmes and discuss the strategic direction of the Academy. Some of the major decisions and activities of the GC include:

- The approval of the review of salaries to be aligned to the labour market and a pension scheme for staff.
- The creation of the Audit and Risk Committee (see page 23).
- Providing direction and input into the mandate of the Good Financial Grant Practice initiative (see page 10).
- The approval of the group life and group personal accident cover for staff.
- The approval of the collection of membership fee for Fellows.
- Examined and approved the MoU that was signed by AESA partners.
- Reviewed and approved the AESA charter, which was signed by the AAS President Aderemi Kuku and Secretary General Georges-Ivo Ekosse.

Achievements of AAS Fellows

These include:

- Prof Ameenah Gurib-Fakim was inaugurated as President of Mauritius in June. Prof Gurib-Fakim, a chemistry researcher who focuses on medicinal plants, is the first female president of the island since it gained its independence in 1968.
- Prof Salim Abdool-Karim, Director of the Centre for the AIDS Program of Research in South Africa and Professor Timolean Crepin Kofane, Head of the Department of Physics at Cameroon's University of Yaounde I won the Kwame Nkrumah Continental Prize for Life and Earth Sciences and Basic Sciences, Technology and Innovation, respectively. The African Union announced the winners of the Kwame Nkrumah Prize, which is given out every year to honour scientists who have excelled in life and basic sciences, January.

- Prof Ben-Erik van Wyk from the University of Johannesburg's Department of Botany and Plant Biotechnology in South Africa, was awarded the South African Association of Botanists Gold Medal. The Gold Medal is given to South African botanists whose research is outstanding and has made significant contributions to the advancement of botany.
- Prof Abdel-Shafy Fahmy Obada, immediate-past Vice President of African Academy of Science for Northern Africa was awarded the State Medal of Science and Arts of the first order by the Egyptian president, H.E. Abdel-Fatah El-Sise. The medal is given in appreciation of efforts to use research to serve Egypt.
- Prof Zeyaur Khan from the International Centre for Insect Physiology and Ecology, icipe, won the prestigious Louis Malassis Prize for Outstanding Career in Agricultural Development in recognition for his work on developing the 'push-pull' system to control pests and weeds.
- Prof Shem Wandiga, a Professor of chemistry at Kenya's University of Nairobi and Prof Tebello Nyokong from South Africa's Rhodes University were among eight recipients of the UNESCO Medal for the Development of Nanoscience and Nanotechnologies. UNESCO gives the prize to researchers whose work has had a profound impact within the discipline.
- Berhanu Abegaz, the Executive Director of the AAS, was elected Chair of the UNESCO International Basic Sciences Programme (IBSP) scientific board. The United Nations Educational, Scientific and Cultural Organization established the multidisciplinary programme to strengthen national capacities in the basic sciences and science education. Its scientific board advises UNESCO's leadership on basic science matters.
- Prof Anthony Youdeowei was awarded the International Plant Protection Award of Distinction for his contribution to global plant protection and food security through his professional activities at Africa Rice Center, FAO, World Bank, icipe and universities in

Nigeria, Ghana and Kenya. The International Association for the Plant Protection Sciences gives out the award to honour individuals who have made significant contributions to plant protection on an international basis and who otherwise have served with distinction in advancing the cause of plant protection sciences.

- Prof Maurice Tchuenta was nominated as a member of the Pan African University (PAU) Council. The PAU is an initiative of the African Union that has piggy backed on existing infrastructure to set up five campuses in East, West, Central and Southern Africa.

38 Fellows elected in 2015

Every year the AAS elects individuals who have excelled in their fields as Fellows. 2015 was no exception with the Academy electing 2015 new Fellows.

The process of recognition begins by nomination of an individual who may be an African who has excelled in his or her field or a non-African who has recognised expertise on Africa. Relevant specialist committees assess nominees and those that are recommended, are subsequently voted in by AAS fellows and finally approved by the Governing Council.

The 38 were elected for excelling in their fields and contributing to developing their field of expertise, include five Associate Fellows and 33 Fellows from different countries in Africa and across the globe. Associate Fellows are non-Africans who have contributed to the development of science on the continent.

The 38 Fellows span fields include biosciences, physical sciences, medical sciences, mathematics, biosciences and humanities and social sciences.

South Africa has the highest number of Fellows elected in 2015 at 11 while Ethiopia and Nigeria follow suit at six each. Other Africa-based Fellows are from Burkina Faso, Cameroon, Togo, The Gambia, Ghana, Morocco, Tanzania, Uganda and Zimbabwe. Associate Fellows were drawn from Canada, China, India and the United Kingdom.

The 38 Fellows



Name: AKLILLU, Eleni
Country: Sweden / Ethiopia
Field: Medical and Health Sciences



Name: AWUAH, Esi
Country: Ghana
Field: Geological, Environmental, Earth and Space Sciences



Name: BALASUBRAMANIAN, Dorairajan
Country: India
Field: Biosciences



Name: GRAY, Glenda Elisabeth
Country: South Africa
Field: Medical and Health Sciences



Name: COOVADIA, Hoosen
Country: South Africa
Field: Medical and Health Sciences



Name: DAAR, Abdallah
Country: Oman/Canada (Tanzania)
Field: Medical and Health Sciences



Name: EL MOURSLI Rajaâ C.
Country: Morocco
Field: Physical Sciences



Name: HANEKOM, Willem
Country: South Africa
Field: Medical and Health Sciences



Name: EKESI, Sunday
Country: Nigeria
Field: Agricultural and Nutritional Sciences



Name: FALADE, Catherine Olufunke
Country: Nigeria
Field: Medical and Health Sciences



Name: FAROMBI, Ebenezer
Country: Nigeria
Field: Biosciences



Name: JAYE, Assan
Country: Gambia
Field: Medical and Health Sciences



Name: FETENE, Masresha
Country: Ethiopia
Field: Biosciences



Name: FISH, Eleanor
Country: Canada (United Kingdom)
Field: Medical and Health Sciences



Name: GLITHO-AKUESON, Isabelle
Country: Togo
Field: Biosciences



Name: MAJOZI, Thokozani
Country: South Africa
Field: Engineering Technology and Applied Sciences



Name: HABTEMARIAM, Solomon
Country: United Kingdom (Ethiopia)
Field: Biosciences



Name: HABIB, Adam Mahomed
Country: South Africa
Field: Cultural Sciences, Humanities and Social Sciences



Name: QUAKYI, Isabella
Country: Ghana
Field: Biosciences



Name: RAMJUGER-NATH, Deresh
Country: South Africa
Field: Engineering Technology and Applied Sciences



Name: HAILE, Sossina
Country: Ethiopia/USA
Field: Engineering Technology and Applied Sciences



Name: IBE, Oliver
Country: USA/ Nigeria
Field: Engineering Technology and Applied Sciences



Name: SHEPHARD, Gordon
Country: South Africa
Field: Chemical Sciences



Name: SIMPOIRE, Jacques
Country: Burkina Faso
Field: Biosciences



Name: JONNALAGADDA, Sreekantha
Country: South Africa
Field: Chemical Sciences



Name: KUMWENDA, N. Isaac
Country: Malawi
Field: Medical and Health Sciences



Name: VALE, Peter Christopher
Country: South Africa
Field: Cultural Sciences, Humanities and Social Sciences



Name: VILAKAZI Zebon
Country: South Africa
Field: Physical Sciences



Name: MAHOMED Fazal Mahmood
Country: South Africa
Field: Mathematical Sciences



Name: MARSH, Kevin
Country: United Kingdom
Field: Medical and Health Sciences



Name: ZEWDE, Bahru
Country: Ethiopia
Field: Cultural Sciences, Humanities and Social Sciences



Name: MIZRAHI, Valerie
Country: Italy / Zimbabwe
Field: Medical and Health Sciences



Name: SEWANKAMBO, Nelson
Country: Uganda
Field: Medical and Health Sciences



Name: MUTAPI, Francisca
Country: Zimbabwe/ United Kingdom
Field: Biosciences



Name: OZOEMENA, Kenneth Ikechukwu
Country: Nigeria / South Africa
Field: Chemical Sciences



Name: TANGWA, Godfrey Banyuy
Country: Cameroun
Field: Cultural Sciences, Humanities and Social Sciences



Name: ZHANG, Linqi
Country: China
Field: Medical and Health Sciences



Name: MOGESSIE, Aberra
Country: Austria / Ethiopia
Field: Geological, Environmental, Earth and Space Sciences

Number of Fellows per discipline

Discipline	Number of Fellows
Agricultural & Nutritional Sciences	1
Biosciences	8
Chemical Sciences	2
Cultural Sciences, Humanities and Social Sciences	5
Engineering Technology and Applied Sciences	4
Geological, Environmental, Earth and Space Sciences	2
Mathematical Sciences	1
Medical and Health Sciences	13
Physical Sciences	2
Grand Total	38

- Providing training in proposal writing, manuscript preparation, writing and presentation, ethical conduct of research, intellectual property, reviewing papers and proposals
- Providing opportunities for affiliates to be mentored by experts in their fields. The experts are AAS fellows and scientists from across the globe.
- Facilitating for affiliates to attend major conferences organised by the AAS and other organisations.

The AAS selected for the first cohort comprising 15 young scientists in 2015.

The 15 have been selected from the regions of Africa to be AAS Affiliates for a period running from 2016 to 2020. A press release announcing who they are will be released at the AAS 10th General Assembly taking place in Kasane, Botswana on 21-22 June 2016.

AAS Affiliates

In 2015 the AAS launched a call for nominations for its Affiliates programme to recognise, mentor and help early career professionals develop into world class research leaders.

Every year the AAS will select Affiliates from each region who are below the age of 40, have

PhDs and doctoral experience work in academic and research institutions in any field. These are designated as AAS Affiliates for five years. During the five years, the AAS will organise activities to develop the Affiliates' careers that include:

AAS Secretariat Report



AAS staff

Review of policies and systems

With the number of staff growing to 30 in 2015, it has been necessary to upgrade infrastructure and review policies to provide an improved and bigger workspace and to adhere to international standards. The AAS has updated its human resources policy and is introducing other new policies that include one for travel for staff and grantees.

In addition, key partners have committed to handing over the management of their programmes to the AAS-AESA. With 11 grants for DELTAS Africa and 450 Grand Challenges grantees to be managed through the GC Africa programme, the AAS has taken the initiative to tender for a new finance and grants management system to increase its efficiency in managing its finances and programmes.

Consequently, the AAS procured and installed the Microsoft Dynamics, Serenic Navigator, a new finance Management Information System to increase efficiency in managing financial information and book keeping. The finance system keeps records of expenditure, which will make it easy to track budgets and compile financial reports per funder, programme and the AAS as a whole.

The AAS Ishango Online System, a grants management system, also was procured and developed to allow for online applications and reviews for AAS calls for proposals and nominations for AAS Fellows as well as facilitate the programmatic functions for managing DELTAS and GCA.

ICT development

To cater for the AAS' growing ICT needs the Academy developed a five-year strategy in 2015 that it is now implementing. The strategy necessitated the Academy to recruit a full-time ICT administrator to help steer the implementation of the strategy.

In line with the new ICT strategy, the AAS has added a well-equipped server room and created a local area network in addition to the WIFI internet access. In addition, the AAS has improved the internet security and boosted its ability to handle higher internet band width. This will facilitate easy of access of the online systems.

Staff training

AAS staff, including DELTAS Africa programme management staff, undertook an intensive two-week training in grants management at the Wellcome Trust in London in

November/December 2015. The training was to increase skills and provide tools for staff to effectively and efficiently implement the DELTAS Africa so it achieves its stated objectives.

Audit and Risk Committee

In 2015 the AAS created an Audit and Risk Committee (ARC), which reviews the Academy's financial accounts. The seven-member committee comprising independent non-executive members, the AAS Treasurer, Executive Director and Chief Operating Officer reviews the Academy's financial accounts and Risks Profiles of the Academy quarterly. The ARC is headed by a suitably qualified independent finance professional, Frederick Murunga, who has many years' experience as an Audit Manager of one of the leading Global Audit firms as well as leading a private corporation based in Uganda. The ARC held three meetings in 2015 on 11 February, 27 August and 2 December, respectively.

Highlights of key events and visitors

Scientific Lecture

On 4 May, Prof Nelson Torto, the Chief Executive Officer of the Botswana Institute for Technology Research and Innovation and an AAS Fellow gave a scientific lecture titled 'Botswana embraces nanotechnology through the Botswana institute for technology research and innovation' at the AAS offices in Nairobi, Kenya.

Mentoring Train-the-Trainer Workshop

On 16 -17 May, CIRCLE organised a Mentoring Train-the-Trainer Workshop in Johannesburg, South Africa for 33 mentoring coordinators designated by CIRCLE participation institutions. Participants shared their experiences on how they handle mentorship in their institutions and also developed a draft a job description detailing the competences of an effective mentor.

Introduction to the Next Einstein Forum

On 30 June, Dr Nkem Khumbah, a Lecturer of Comprehensive Studies Program and Co-Coordinator of the STEM-Africa Initiative at the University of Michigan and the Executive Curator of the Next Einstein Forum visited the AAS to present the Next Einstein Forum to staff. NEF is an initiative of the African Institute for Mathematical Sciences (AIMS) and the Robert Bosch Stiftung to provide a platform that brings together leading thinkers in science, policy, industry and civil society in Africa to leverage science to solve global challenges.

1st KAST-AAS Bilateral Symposium

On 6-7 July the AAS and the Korean Academy of Science and Technology held the first KAST-AAS Bilateral Symposium under the theme *Recent advances in bio-sciences and bio-technology for socio-economic development* in Nairobi, Kenya. The symposium had five speakers each from the AAS and KAST who spoke on ranging topics that include

transgenic plants with resilience to environmental stress; cell biology and regenerative medicine; industrially useful extractives from environmental sources and natural products.

KAST President Sung Hyun Park and AAS President Aderemi Kuku opened the symposium by encouraging increased collaboration between the two academies.

Proposal Development Workshop

On 20-22 July the AAS' Alliance for Accelerating Excellence in Science in Africa (AESA) held a workshop for 28 early and mid-career scientists to help them improve their skills for writing proposals. This workshop, which was fully funded by the Bill and Melinda Gates Foundation, was held in Addis Ababa, Ethiopia.

Consultative Meeting on Scientific Equipment Policy

On 20-21 August 2015, the IFS and the AAS held a consultative meeting at the AAS offices in Nairobi to discuss how to raise pan African awareness on the need for science equipment policies.

1st AAS Pan-African Science Olympiad (PASO)

On 23-28 August the AAS partnered with the Nigerian Federal Ministry of Education and the National Mathematical Centre to host the 1st AAS Pan African Science Olympiad in Abuja, Nigeria. Nigeria, Benin Republic, Burkina Faso, Ghana, Mali, Niger Republic, South Africa and Tanzania participated in the olympiad, which was held to encourage young people to take up careers in science. Nigeria won the first prize while Burkina Faso and Ghana were second and third, respectively. AAS President Kuku gave the opening and closing remarks at the ceremony.

DELTA Inception meeting

On 8-10 September, the AAS and the Wellcome Trust hosted five programme and finance staff from each of the initial seven funded programmes in Nairobi for the DELTA Inception meeting. The Wellcome Trust and AAS/AESA shared their expectation of how the programme should be implemented and reporting requirements for grantees.

AESA launch

On 10 September, the AAS and its partners hosted 300 delegates from across Africa and the globe at the launch of the Alliance of Accelerating Excellence in Science in Africa in Nairobi.

Efficacy of microscience experiments in primary and secondary schools in Kenya

On 24-25 November, the AAS hosted a UNESCO working group on microscience to discuss a pilot project on microscience in Kenya.

CIRCLE Workshops

From 5-7 February, the first cohort of CIRCLE Visiting Fellows took part in an induction workshop at the AAS secretariat.

Two CIRCLE Champions workshops were held at AAS secretariat from 2-4 February and 9-11 December. This is a meeting of senior representatives from CIRCLE participating institutions. This is part of the CIRCLE Institutions Strengthening component.

Financial Statements

AFRICAN ACADEMY OF SCIENCES STATEMENT OF INCOME AND EXPENDITURE (unaudited)

As at 31 December

	2015 USD	2014 USD
Grant income	5,118,103	130,112
Other operating income	382,269	367,017
Programme and administrative expenses	(2,091,999)	(647,038)
Finance (costs)/income	(425,510)	83,583
TOTAL EXPENDITURE	(2,517,509)	(563,455)
SURPLUS/DEFICIT FOR THE YEAR	2,982,863	(66,326)
OTHER COMPREHENSIVE INCOME		
Items that may be reclassified subsequently to statement of income and expenditure:		
Translation differences	-	(289,566)
Total comprehensive surplus/(deficit) for the year	2,982,863	(355,892)

AFRICAN ACADEMY OF SCIENCES
STATEMENT OF FINANCIAL POSITION (unaudited)

As at 31 December

	2015	2014
	USD	USD
FUND BALANCES		
Unrestricted funds	2,720,361	1,098,016
Endowment Fund	4,715,800	4,678,489
Translation reserve	-	(1,326,523)
Revaluation reserve	2,193,219	2,196,535
	9,629,380	6,646,517
REPRESENTED BY		
NON CURRENT ASSETS		
Intangible assets	121,463	1,353
Property and equipment	2,725,270	2,623,929
	2,846,733	2,625,282
CURRENT ASSETS		
Receivables	148,786	9,058
Cash and cash equivalents	6,655,875	4,737,559
	6,804,661	4,746,617
CURRENT LIABILITIES		
Payables	22,014	20,819
Deferred income	-	704,563
	22,014	725,382
NET CURRENT ASSETS	6,782,647	4,021,235
	9,629,380	6,646,517

NOTES

1. These financials were in the process of finalisation of the Audit when the Annual Report was produced.
2. They are prepared on a cash basis with accruals made at year end for provisions relating to the year but yet to be paid out.
- 3.- Year 2015 financials were prepared from a Dollar Accounting base currency whereas 2014 financials had Kenya Shilling as the base converted to USD this has contributed to the change in the policy where the translation reserve is no longer required in 2015 compared to 2014.
4. Within the surplus in 2015 are amounts that are balances to be incurred in year 2016.
5. The year 2015 saw an increase in grant income due to increased funding by the AESA platform which started operations 2015.



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