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Gene Editing Technology Initiative

African scientists use gene editing technology to improve major staple crops for increased productivity, enhanced nutrition and climate resilience. Africa Harvest and NASAC, have partnered with CropLife International, to implement a pioneering proof-of-concept initiative on Gene Editing Technology. To this end African gene editing technology experts were invited to participate in the project and advocate for this technology and its practical application.

Communication and Policy Advocacy are key to changing the narrative of gene editing technology from the previous experiences with genetic modification technology (like GMO). Africa Harvest and NASAC therefore established a working group of gene editing technology initiative (GETI) champions, identified knowledge gaps, and reinforced the commitment to support food security processes through gene editing technology in Africa.

The Working Group formally adopted the name "*African Association of Genome Editing Professionals for Sustainable Agriculture*". The project further intends to expand the GETI champions working group in terms of expertise and geographic representation to cover 25 countries in Africa. Their capacities will be enhanced to better provide an advocacy platform for the adoption of gene editing technology in Africa. The experts will be supported to become the '*voice*' of gene editing technology in Africa and beyond.

The technology has elicited interest across the globe because of the insights it may offer into fundamental biological processes and the advances it may bring to human health and food security. However, these advances still have many unanswered questions about the technical aspects of achieving desired results while avoiding unwanted effects in plants. The Working Group will consider these questions among others. To help direct the use of genome editing towards, it is important to examine the scientific, ethical, and social issues it raises be addressed exhaustively. The capacity of governance systems and regulatory frameworks still needs to be enhanced, even as efforts to create awareness among the public, policymakers, researchers and regulators is being pursued. Doing so also entails articulating the larger principles that should underlie such technologies in addressing societal challenges.

These are not easy tasks, but NASAC and Africa Harvest are grateful to the GETI working group members who participating in the initiative to make some headway. The activities of the initiative will help bring diverse perspectives on gene editing technology and continue to explore existing possibilities with a focus on crops at the moment.

From the President

NASAC appreciates the value of Gene Editing Technology and the value addition of the gene editing technology initiative (GETI) working group. Scientific research with the help of a country political goodwill and regional collaboration constitute inevitably the determining pillars for a balanced and inclusive development for African countries.

In the concept note submitted to CropLife International by Africa Harvest and NASAC, it was emphasized that contemporary agriculture will face enormous challenges, requiring highly yielding crops with fewer inputs. Conventional breeding currently widely used in crop improvement is labour intensive and takes several years to develop a product into commercial varieties according to Zhang and collaborators study in 2018. Genome editing has come under the spotlight with the recent development of CRISPR/Cas systems which provide simplicity and ease of targeted gene editing. The risks involved in gene editing technology products are relatively lower because the changes are not unlike those found in naturally occurring populations. Once the gene editing agents have segregated out, there is no distinction between a *naturally* occurring mutation and a gene edit. Zhang and collaborators concluded the introduction of genome editing into modern breeding programs will facilitate rapid and precise crop improvement.

Despite all its scientific evidence and known benefits, adoption of gene editing in Africa is still limited due to lack of awareness on the technology and misinformation of lining it with genetically modified organisms (GMOs). The series of webinars scheduled are hoped to impart skills that foster communication and participation in advocacy forums to spur conversations on the benefits of the technology in addressing agricultural production challenges and food security in Africa.

The GETI Working Group members are committed to this study and will devote much of their time and energy to deliver the requisite outputs for the project. We urge NASAC members to fully support the Working Group, and provide any necessary expertise or highlight any relevant opportunities for gene editing technology.

Yours Faithfully,

PROF. MAHOUTON NORBERT HOUNKONNOU
President,NASAC

Activities and Events

Africa Climate Week 2021

The InterAcademy Partnership (IAP) together with its regional partner the Network for African Science Academies (NASAC) organized a webinar side event during the Africa Climate Week 2021. The side event title was "Developing and using the scientific evidence base for tackling challenges of climate change for human health". The side event was held on 26 September 2021.

The aim of the webinar was to focus on the priorities to be addressed in climate change transformational solutions for mitigation and adaptation for resilient health systems

The session started with a discussion of opportunities and challenges worldwide, and the objectives to add value by designing the regional work to be inclusive, inter-sectoral and transdisciplinary, independent of vested interests and involving younger researchers.

Uganda National Academy of Sciences (UNAS) Webinar

The Uganda National Academy of Sciences organized a webinar on *"**Science Diplomacy and Partnership**"*. The webinar focused on how science can present evidence to solve disagreement between countries and also the need to have a scientific cooperation between neighboring countries which will help in addressing trans boundary and development challenges .

The webinar was held on 14 September 2021.

Academy of Science of South Africa (ASSAf) 2021 Annual Awards

The Academy of Science of South Africa (ASSAf) held its 2021 Annual Awards ceremony on 20 October 2021.

The new members of the South Africa Young Academy (SAYAS) were also inaugurated at the event.

The keynote speaker was Dr Ismail Serageldin Emeritus Librarian of Alexandria, Former Vice President of World Bank.

Nigerian Academy of Science (NAS) 3rd Annual Scientific Conference

The Nigeria Academy of science will hold its 3rd Annual Scientific Conference on **Tuesday 25th and Wednesday 26th of January, 2022**. This edition of the Conference will be a hybrid event, with both physical and virtual attendees. The theme of the Conference is ***"Science and Technology Innovations for National Growth and Development"***.

The Conference will be framed around seven sub-themes as follows:

- The Internet Revolution and Nigeria: Innovation Start-ups as Engine for Youth Creativity and Economic Revolution
- Strategies for Sustainable Energy Transition in Nigeria
- Drug Development, Phytomedicine, and Phytotherapy
- Environmental Conservation, Pollution, and Control
- Food Security, Safety, and Sustainability
- Science and Innovation in National Security Management
- Uncovering the Talents in Innovation in Nigerian Universities

The Conference would feature invited presentations, alongside oral and poster presentations of original research.

Mauritius Academy of Science and Technology (MAST) Climate Change Forum

The Mauritius Academy of Science and Technology (MAST) organized a forum on climate change.

The objectives of the forum were:

- The extent of this Planet's climate crisis
- Climate change and health
- Climate change and energy
- The UNFCCC agreements between the Parties to act on climate change; Implementation of the UN Paris Accord; preparation for COP26 in Glasgow, November 2021
- The Mauritius situation
- The Mauritius response.

Announcements and Appointments

Nigeria Academy of Science (NAS)

The Nigerian Academy of Science (NAS) is pleased to announce that Professor Olanike Adeyemo FAS has been appointed to the membership of the Committee on World Food Security (CFS) High-Level Panel of Experts on Food Security and Nutrition (HLPE) Steering Committee. She is the only appointee from the African Continent.

The High Level Panel of Experts (HLPE) on food security and nutrition was established as part of the 2009 reform of the international governance of food security, to advise the Committee on World Food Security (CFS) which is the foremost intergovernmental and international platform dealing with food security and nutrition.

Professor Olanike Adeyemo FAS who is the Academy's representative, Biological Sciences, is a Professor of Aquatic and Wildlife Disease Epidemiology & Toxicology. She is the Pioneer Deputy Vice-Chancellor (Research, Innovation and Strategic Partnerships) at the University of Ibadan, Ibadan. Professor Adeyemo also heads the Oyo State COVID-19 Decontamination and Containment Committee arm of the Oyo State COVID-19 Taskforce.

The World Health Organization (WHO) appointed Professor Oyewale Tomori FAS to serve as a member of its Technical Advisory Group on COVID-19 vaccine composition on Wednesday, 29th of September, 2021.

The Technical Advisory Group on COVID-19 Vaccine Composition (TAG-CO-VAC) is an independent group of experts that will periodically review the evidence and analyze the implications of emerging Variants of Concerns (VOC) on the performance of COVID-19 vaccines.

Professor Tomori who is a Past President of the Nigerian Academy of Science is a renowned professor of virology, with experience in viral infections, disease prevention and control. He is Chairman, Ministerial Expert Advisory Committee on COVID-19 Health Sector Response (MEACoC-HSR). As Chairman of the Nigeria Expert Review Committee on Polio Eradication and Routine Immunization from 2004 to date, he was instrumental to Nigeria's efforts to eradicate polio in the country.

Professor Uche Amazigo FAS was appointed, by the President of Nigeria, into the Health Sector Reform Committee. Professor Amazigo is a Professor of Medical Parasitology and she is currently the Academy's Representative, Biological Sciences.

L'Académie Nationale des Sciences, Arts et Lettres du Benin (ANSALB)

The Plenary Assembly of L'Académie Nationale des Sciences, Arts et Lettres du Benin (ANSLAB) during its ordinary session of June 4, 2021 elected two eminent researchers as associate members of the Academy.

Dr. Papa Abdoulaye SECK
Specialist in Agricultural Policies and Strategies
Former Minister of Agriculture and Rural Equipment of Senegal,
Currently Ambassador of Senegal in Italy and Permanent Representative of Senegal to the United Nations Agencies based in Rome (FAO, WFP, IFAD, etc.)

Cato Thomas Laurencin, MD, PhD
University Professor
Specialties: chemical and biomolecular engineering materials science and engineering
Albert & Wilda Van Dusen Chair in Orthopaedic Surgery at the University of Connecticut (USA)

Tunisian Academy of Arts and Letters

Prof**.** Habiba Bouhamed Chaabouni has been elected to be a member of the Mediterranean Science Team that was selected by an international jury in the European program MEDNIGHT.
The awards took palce in Alicante Spain on 24 September 2021.
The aim of the team is to disseminate Science all around the Mediterranean Sea especially for young people.

International Science Council (ISC) new Governing Board

The International Science Council(ISC) memebers at its 2nd ISC General Assembly elected four Officers of the Governing Board and ten Ordinary Members to join the incoming President of the ISC, Peter Gluckman, who takes up his presidency at the conclusion of the 2021 General Assembly.

Motoko Kotani has been elected as President-Elect, assuming the Presidency at the next General Assembly in 2024.

Anne Husebekk has been elected as Vice-President for Freedom and Responsibility in Science, Salim Abdool Karim as Vice-President for Outreach and Engagement, and Sawako Shirahase as Vice-President for Finance of the Council.

The ten Ordinary Members of the Governing Board elected are: Karina Batthyány; Françoise Baylis; Geoffrey Boulton; Melody Burkins; Mei-Hung Chiu; Pamela Matson; Helena Nader; Walter Oyawa; Maria Paradiso; Martin Visbeck. The Chief Executive Officer, Heide Hackmann, is an ex-officio Member of the Governing Board.

Abdulrazak Gurnah wins Nobel Prize in Literature

The Nobel Prize in Literature 2021 was awarded to prof. Abdulrazak Gurnah for his uncompromising and compassionate penetration of the effects of colonialism and the fate of the refugee in the gulf between cultures and continents.

Prof. Abdulrazak Gurnah has published ten novels and a number of short stories. The theme of the refugee's disruption runs throughout his work. He began writing as a 21-year-old in English exile, and although Swahili was his first language, English became his literary tool.

On the Spotlight

Gender Equality in Science: Inclusion and Participation of Women in Global Science Organizations. Results of two global surveys'

A study reporting on the **inclusion and participation of women in over 120 science organizations** that are coordinated at a global level finds that women are still under-represented. It calls for a coalition for gender equality in global science to ensure a transformative action agenda.

The study was coordinated by GenderInSITE (Gender in Science, Innovation, Technology and Engineering), in partnership with the InterAcademy Partnership (IAP) and the International Science Council (ISC). It reports on the results of surveys conducted amongst science academies that are members of the IAP and ISC, as well as amongst international disciplinary unions and associations that are members of the ISC.

Together, the IAP and ISC represent over **250 unique organizations globally**, and cover science in its broadest sense, being inclusive of natural, engineering, medical, social sciences and the humanities. This is a powerful nascent coalition for gender equity in science that seeks to build capacity and impact through expansion of the network.

The survey results allow for comparisons with a previous study undertaken in 2015, and provide important baseline information for **much-needed gender transformation in global science**.

Prof Daya Reddy, current ISC president and former co-chair of IAP Policy welcomed the collaboration among the three partners. "It is critically important that international science organizations now come together to address recurring gender disparities in their own structures. Despite progress in the recent past, the overall predominance of men remains, and this is not acceptable. Societies expect more diverse gender representation in science."

While the study reports that **women's elected membership** in senior academies has increased from 13% (2015) to 16% (2020), there are still 19 academies that report 10% or less female membership. Young academies are significantly more gender-balanced than their senior counterparts, with the average share of women's membership of respondents being 42%. Ten young academies rank ahead of the senior academy with the highest number of female members, namely the Academy of Sciences of Cuba with 33%. The achievement of young academies in respect of **gender balance** presents an important learning opportunity for senior academies. It is also imperative that this balance is not lost as the careers of these young scientists advance.

A striking finding was that only six academies stated that the results of the 2015 survey report, which contained many recommendations for academies, was discussed at a strategic planning session. This failing is addressed in the current report through a stronger and more directed recommendation to bring the results of the current survey to the attention of relevant academy governing bodies. Both the IAP and the ISC are called upon to **regularly report gender-disaggregated statistics** in their annual reports, and at their general assemblies, to ensure that gender transformation is tracked.

IAP co-President, Sir Richard Catlow, remarked, "It is pleasing to see that some progress has been made since the 2015 academy report, so we are moving in the right direction. However, progress is slow, and we strongly encourage all academies to discuss and act upon all the recommendations of both this and the earlier report. We

trust that this report will further stimulate academies to take action to promote diversity in all their activities. Our policy recommendations can be considered inclusive only if academies represent the full diversity of their communities."

The **under-representation of female members of academies** is greatest in the engineering sciences (10%) and mathematical sciences (8%).

Almost two-thirds (64%) of ISC disciplinary unions and associations reported that they have published findings that specifically address issues related to women or gender, but only about a third (34%) have a strategy to increase women's participation in their activities. Even fewer (16%) reported having a **budget** to implement activities related to gender equality.

The report makes several **key recommendations**, for example, the establishment of a central repository of gender-related policies and actions to identify best practices and guide those academies and disciplinary unions seeking to implement changes.

The report also calls for the application of a **regional lens** and for the study partners to utilize their regional presence to gain insights and to advance the **gender equality agenda**, especially in countries/regions that are lagging.

A **call to promote women's leadership** and service on governing bodies was also made to ensure women's voices are included in the setting of science agendas. The average share of women serving on governing bodies was 29% for academies and 37% for international disciplinary organizations.

Reflecting on a future agenda for the coalition for gender equality in global science, Dr Shirley Malcom, GenderInSITE co-chair noted, "It is important to have gender-disaggregated data to measure the extent of progress. But we must also use these metrics to spur action. We are pleased to be included in this partnership and encouraged by the expectation expressed in this collaboration that together we can move toward more gender equity in global science."

Member Academy Feature

Zambia Academy of Sciences (ZaAS)
Strengthening the mandate of the Zambia Young Academy of Sciences

Recognizing the transformative power of science and the consequential need for the engagement of young people in science for socio-economic development, the Zambia Academy of Sciences established an affiliate scientific organization of young scholars and scientists. The Young academy was established in 2019 with a cohort of five young scientists and scholars that were given a mandate of driving the agenda of promoting science, technology and innovation among the young people of Zambia. The first cohort of young scientists set out to make institutional arrangements for carrying out its national mandate.

This undertaking was started against the backdrop of financial limitations. In this regard, the Zambia Academy of Sciences sought opportunity with the Network of African Science Academies (NASAC) for financial support towards the proposed project of strengthening the mandate of the Zambia Young Academy of Sciences.

The proposed project was designed to pursue three specific objectives: 1) finalizing the development of the ZYAS constitution by the end of October, 2020; 2) finalizing the development of a five-year Strategic Plan for the ZYAS by the end of November, 2020; and 3) recruiting the second cohort of ZYAS members by the end of December, 2020. The intended outcome of the project was institutional strengthening of the young academy towards the vision of having a country where young people embrace science, technology and innovation as a vehicle of socio-economic development.

Following successful application for a USD 5,000 NASAC grant for the proposed project, the ZYAS project was executed between the months of October and December in 2020 with resounding success in achieving the intended outputs and outcomes. The young scientists and scholars demonstrated commitment, dedication and strategic thinking towards advancing science, technology and innovation as a vehicle of socio-economic development. The input from stakeholders and the senior scientists was remarkable and invaluable to the process, and as such the Zambia Academy of Sciences is enthusiastic that the Zambia Young Academy of Scientists is well positioned to carry out its mandate.

Young Scientists and scholars working on the NASAC funded ZYAS project

About NASAC

The Network of African Science Academies (NASAC) was established on 13 December 2001 in Nairobi, Kenya and is currently the affiliate Network for InterAcademy Partnership (IAP) in Africa.

NASAC is a consortium of merit-based science academies in Africa that aspires to make the "voice of science" heard by policy and decision makers within and outside the continent. NASAC is dedicated to enhancing the capacity of existing national science academies and champions in the cause for creation of new academies where none exist

As at November 2019, NASAC comprised of the following twenty-eight members:

1. **African** Academy of Sciences (AAS)
2. **Algerian** Academy of Science and Technology (AAST)
3. Académie Nationale des Sciences, Arts et Lettres du **Bénin** (ANSALB)
4. **Botswana** Academy of Sciences (BAS)
5. Académie Nationale des Sciences du **Burkina** (ANSB)
6. **Burundi** Academy of Sciences and Technology (BAST)
7. **Cameroon** Academy of Sciences (CAS)
8. Académie Nationale des Sciences et Technologies du **Congo** (ANSTC)
9. Académie des sciences, des arts, des cultures d'Afrique et des diasporas africaines, **Cote d'Ivoire** (ASCAD)
10. Academy of Scientific Research and Technology, **Egypt** (ASRT) – *Provisional Member*
11. **Ethiopian** Academy of Science (EAS)
12. **Ghana** Academy of Arts and Sciences (GAAS)
13. **Kenya** National Academy of Sciences (KNAS)
14. **Madagascar's** National Academy of Arts Letters and Sciences
15. **Mauritius** Academy of Science and Technology (MAST)
16. Hassan II Academy of Science and Technology in **Morocco**
17. Academy of Sciences of **Mozambique** (ASM)
18. **Nigerian** Academy of Science (NAS)
19. **Rwanda** Academy of Sciences (RAS)
20. Académie des Sciences et Techniques du **Sénégal** (ANSTS)
21. Academy of **Science of South** Africa (ASSAf)
22. **Sudanese** National Academy of Science (SNAS)
23. **Tanzania** Academy of Sciences (TAS)
24. Académie Nationale Des Sciences, Arts Et Lettres Du **Togo** (ANSALT)
25. **Tunisia** Academy of Sciences Arts and Letters
26. **Uganda** National Academy of Sciences (UNAS)
27. **Zambia** Academy of Sciences (ZaAS)
28. **Zimbabwe** Academy of Sciences (ZAS)

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