2024 ANNUAL MEETING OF AFRICAN SCIENCE ACADEMIES (AMASA 2024)

SUMMARY REPORT

Algiers, Algeria | **26-28 November 2024**

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EXECUTIVE SUMMARY

The academies of science in the continent convened in Algiers, Algeria, for the 2024 Annual Meeting of African Science Academies (AMASA 2024) under the umbrella of the Network of African Science Academies (NASAC). This landmark gathering, hosted by the Algerian Academy of Science and Technology (AAST), brought together leading scientists, policymakers, and key stakeholders to advance scientific collaboration and innovation. Under the overarching theme of ***Resources, Science and Technology for Development in Africa***, the event served as a platform for critical discussions on leveraging Africa's scientific potential to address pressing challenges and drive sustainable development. The theme was further broken down into three critical subthemes:

(i) Ensuring One Health in Africa: Mathematical, Numerical and Biotechnological Approaches
(ii) Natural Hazards and their Impact on the Environment and Health in Africa
(iii) Mobilisation of Skills and Pooling Scientific and Technological Resources in Africa

Over a period of three days from 26th–28th November 2024, AMASA 2024 featured a series of impactful talks, high-level panel discussions, keynote addresses, and side events covering a diverse range of topics like financial sustainability, open science, decarbonisation, artificial intelligence, personalised medicine, science diplomacy, and human resource mobility, among others. Experts underscored the urgent need for Africa to strengthen its research ecosystem, enhance collaboration among institutions, and adopt policies that foster innovation, technology transfer, and knowledge sharing.

Key insights from the discussions emphasised the importance of investment in higher education and postgraduate training, the role of emerging technologies in improving health and climate resilience, and the need to develop robust policies to support scientists' mobility and counteract the adverse effects of brain drain. The role of science diplomacy in fostering international cooperation was also discussed, with calls for stronger engagement between African academies and global institutions.

AMASA 2024 concluded with a strong commitment to action, with participants agreeing on strategic recommendations to enhance Africa's scientific capacity. These include increased funding for research and development, policy frameworks to support regional integration in science and technology, and the establishment of collaborative platforms to harness the collective expertise of African scientists.

Looking ahead, AMASA 2025 will build on the momentum generated during AMASA 2024 and would tentatively be hosted by the academy of science in Morocco. The outcomes of AMASA 2024 reaffirm the critical role of science in shaping Africa's future and underscore the necessity of sustained collaboration and investment in research for the continent's development.

FOREWORD

The future of Africa's scientific and technological advancement hinges on robust policies, strong institutions, and collaborative frameworks that drive impactful research and innovation. The Annual Meeting of African Science Academies (AMASA) continues to be a cornerstone in fostering dialogue and strategic partnerships that shape the continent's science, technology, and innovation (STI) landscape.

AMASA 2024 provided a vital platform for African science academies, policymakers, researchers, and industry leaders to deliberate on pressing scientific challenges and explore sustainable solutions. Under the theme ***"Resources, Science and Technology for Development in Africa"***, AMASA 2024 underscored the pivotal role of evidence-informed decision-making in addressing global and regional challenges, including '*One Health', 'Natural Hazards', and 'Skills mobilisation'*.

As Presidents of NASAC and AAST, we recognise the collective responsibility of our institutions in advancing Africa's development agenda. The insights and recommendations from AMASA 2024 reaffirm our commitment to strengthening the interface between science and policy, ensuring that African-led perspectives contribute meaningfully to global scientific discourse.

This Summary Report captures key discussions, resolutions, recommendations and action points that emerged from AMASA 2024. It serves as a guiding-document for stakeholders across the continent and beyond, highlighting the essential role of science academies in fostering a knowledge-driven society.

We extend our sincere appreciation to all participants, speakers, panelists and partners who contributed to the success of AMASA 2024. We also acknowledge the unwavering support of our member academies, whose dedication to excellence continues to propel Africa's scientific progress.

As we look ahead, we remain committed to strengthening collaboration, advocating for increased investment in research and innovation, and ensuring that Africa's scientific community is well-positioned to address the continent's developmental needs. We invite all stakeholders to engage with the outcomes of this Summary Report and join us in translating scientific knowledge into tangible societal benefits.

Prof. Mahouton Norbert Houkonnou
President, Network of African Science Academies (NASAC)

Prof. Mohamed Hichem Kara
President, Algerian Academy of Science and Technology (AAST)

MESSAGE FROM THE SCIENTIFIC COMMITTEE

The Scientific Committee of AMASA 2024 was tasked with curating a programme that would inspire, challenge, and drive meaningful discussions on Africa's sustainable development through science and technology. Under the theme ***Resources, Science, and Technology for Development in Africa,*** we sought to bring together leading experts, policymakers, and early-career researchers to explore innovative approaches for leveraging Africa's vast natural and intellectual resources. The selection of speakers and thematic sessions was guided by our commitment to inclusivity, excellence, and relevance. This approach ensured that AMASA 2024 was not only informative but also a catalyst for action in advancing Africa's scientific and technological aspirations.

Prof. Khedidja Allia
President, AMASA 2024 Scientific Committee

Members:
Central Africa: CAS – Prof. Sammy Chumbow (Cameroon)
East Africa: KNAS – Prof. Vasey Mwaja (Kenya)
North Africa: AAST – Prof. Khedidja Allia (Algeria)
Southern Africa: ASSAf – Prof. Irvy Gledhill (South Africa)
West Africa: ANSAL-BF – Dr. Paco Sereme (Burkina Faso)

MESSAGE FROM THE ORGANISING COMMITTEE

Delivering a seamless and enriching experience for all participants was the core mandate of the Organising Committee. From handling logistics to ensuring the well-being of attendees, we worked diligently to create an environment that fostered collaboration, networking, and engagement in delivering the AMASA 2024 programme. The success of AMASA 2024 was made possible through the dedication of our team and the invaluable support of our partners, whose efforts ensured a smooth and productive gathering. We are confident that the connections made at the conference, and the ideas exchanged will continue to shape Africa's development agenda for years to come.

Prof. Djillali Benouar
Chair, AMASA 2024 Organising Committee

Members:
Dr. Jackie Kado
Prof. Mustapha Meghraoui
Prof. Laraba-Djebari Fatima
Dr. Khodja Mohamed
Prof. Touaoula Tarik
Dr. Zoubir Harrat
Prof. Sif-Eddine Amara
Mr. Latreche-Bouteldja Rabeh
Mrs. Kamira Daoudi
Mr. Abdelghani Baouche

INTRODUCTION

The 2024 Annual Meeting of African Science Academies (AMASA 2024) was held from 26–28 November 2024 on the theme ***'Resources, Science and Technology for Development in Africa'*** in Algiers, Algeria. The Algerian Academy of Science and Technology (AAST) hosted the meeting at the International Conference Center (CIC) in Algiers. The sessions were structured to encourage active participation through thematic presentations, panel discussions, and group dialogues. The meeting brought together more than 150 delegates, including representatives from NASAC member academies, partner organisations, the media and the public. The conference was organised into three thematic sessions based on sub-themes:

SESSION 1:
Ensuring One Health in Africa – mathematical, numerical, and biotechnological approaches

This sub-theme involved integrating the latest developments in mathematical and numerical sciences such as mathematical modeling and Artificial Intelligence (AI) into various medical and hospital fields in Africa. Strengthening the use of modern and quality technological tools in research in biotechnology and nanotechnology to facilitate the harmonious evolution of society was also discussed.

SESSION 2:
Natural hazards and their impact on the environment and health in Africa

This sub-theme explored the scientific fields that required scientific input in the development of necessary preventive strategies for the continent. Africa is confronted with various natural disasters and risks like earthquakes, volcanic eruptions, droughts, floods, forest fires, landslides, storms, typhoons, locust invasions, epidemics, etc. The consequences of these risks and hazards are dire to the environment and human health. Science should aim to mitigate these natural disasters and reduce the risks through predictive and preventive strategies. In the session, special attention was given to modern urban technologies that aim to improve disaster risk management.

SESSION 3:
Mobilisation of skills and pooling of scientific and technological resources in Africa

This sub-theme focused on the education and scientific development of Africa through research conducted annually by universities and scientific centres in Africa, with the participation of doctoral students, and junior and senior researchers. Discussions were centred around the valorisation and mobilisation of these high-quality scientific and technological skills in Africa as a long-term investment for our countries. The pooling of

research resources, especially large-scale research resources across the African continent, was emphasised as one of the keys to rapid development.

The conference also featured two side events and two report launches, i.e.:

Side Event 1:

Learning collaborative event on '*Maintaining Financial Sustainability with Independence: Empowering Academies of Science and Universities as Catalysts for Development'*.

Side Event 2:

Workshop on '*Harnessing Open Science for One Health and Natural Hazards Resilience in Africa'*.

Report Launch 1:

A 90-Minute Session and launch of the '*Decarbonisation of Transport in Africa: Resilience, Technology, Innovation, and Policy Report*'.

Report Launch 2:

A sponsored event by NASAC, Africa Harvest and CropLife International to publicise the '*Statements on Gene Editing Technology'*.

OPENING CEREMONY

The opening ceremony of the AMASA 2024 conference, themed *"Resources, Science and Technology for Development in Africa"*, was marked by a series of impactful speeches and goodwill messages from key stakeholders in the African scientific and technological community.

Opening Speeches

The opening speeches were delivered by the Presidents of the Algerian Academy of Science and Technology (AAST), Prof. Mohamed Kara, and the Network of African Science Academies (NASAC), Prof. Norbert Hounkonnou. Serving as Co-Chairs of the conference, their speeches underscored the critical importance of leveraging Africa's natural resources through the application of science and technology for sustainable development on the continent.

The President of AAST underscored the urgent need to tackle Africa's developmental challenges by harnessing the power of science, technology and innovation (STI). He emphasised that addressing these challenges requires strategic collaboration between African nations, international partners, and the broader scientific community. By working together, these stakeholders can unlock Africa's vast potential and ensure that the continent achieves sustainable development. The AAST President highlighted key areas, such as agriculture, energy, and healthcare, where innovation and technological advancements are essential for driving growth and improving livelihoods. He stressed that these sectors are crucial to achieving the United Nations' Sustainable Development Goals (SDGs). More specifically, in addressing issues like food security, energy access, and healthcare infrastructure. His speech called for a collective effort to harness science and technology as core drivers of Africa's transformation, positioning them

AAST President Prof. Mohamed Hichem Kara giving his opening remarks

AAST President Prof. Mohamed Kara and NASAC President Prof. Norbert Hounkonnou at the event

Participants at the opening ceremony

as fundamental tools for creating a more prosperous and resilient continent.

In his opening speech the President of NASAC expressed gratitude to the AAST for hosting the event in Algiers, marking a return to in-person gatherings after the 2023 virtual conference. He emphasised that AMASA is more than just a meeting—it is the heartbeat of NASAC's mission to promote science, technology, and innovation across Africa. The President of NASAC highlighted the theme *"Resources, Science, and Technology for Development in Africa,"* stressing the need to harness Africa's vast resources through robust science and technology frameworks. He introduced the three subthemes for discussion: *One Health*, *Natural Disasters* and *Skills mobilisation*, all of which are vital to Africa's development. He also underscored the importance of collaboration and the role of AMASA in shaping policies and inspiring innovation. His speech concluded with a call to action for active participation, constructive debate, and fostering collaborations that will lead to a scientifically empowered Africa.

Goodwill Messages

The opening ceremony also featured a series of goodwill messages from distinguished individuals and partner organisations:

1. **German Federal Ministry of Education and Research (BMBF)**: The representative from BMBF, Dr. Erik Hansalek, extended support for the conference and emphasised the significance of international partnerships in advancing scientific research and innovation. He highlighted Germany's commitment to collabourating with African nations to promote sustainable development, particularly in the areas of green technologies and renewable energy.
2. **Algerian Academy of Science and Technology (AAST)**: The Immediate Past President, Prof. Malika Allab-Yaker, reflected on the progress made in the African scientific community, acknowledging the contributions of institutions like AAST and NASAC. She expressed optimism for the future, emphasising that the current generation of researchers must take bold steps in addressing Africa's challenges

through innovative solutions. She urged attendees to use the conference as a platform to develop actionable strategies that can lead to tangible improvements in the lives of Africans.

3. **InterAcademy Partnership (IAP)**: The IAP Co-President, Prof. Masresha Fetene, delivered a powerful message, stressing the importance of collaboration between the global science community and African nations. He highlighted the role of the IAP in supporting the African scientific community and affirmed that sustainable development in Africa would be closely tied to effective science diplomacy and international cooperation. He encouraged African scientists to take bold steps in transforming the continent into a global leader in scientific innovation.

4. **Palestinian Academy of Science and Technology**: The President of the Palestinian Academy for Science and Technology (PALAST), Prof. Marwan Awartani, extended solidarity to the African scientific community, recognising the shared struggles faced by both Africa and Palestine in overcoming geopolitical and socio-economic challenges. He emphasised the need for international cooperation to overcome these obstacles and expressed hope that the outcomes of AMASA 2024 would lead to increased scientific collaboration and development in Africa.

Keynote Addresses

1. **The role of STI in achieving the SDGs in Africa**
   By Prof. Norbert Hounkonnou, President of NASAC

   Prof. Hounkonnou underscored the central role of STI in driving Africa's sustainable development and achieving the SDGs. Speaking as NASAC's President, he emphasised the Network's commitment to strengthening national academies across the continent to champion evidence-informed policymaking and transdisciplinary research. He highlighted the importance of regional collaboration, calling on science academies to work together in shaping policies that integrate STI into national and continental development strategies.

   Prof. Hounkonnou also stressed the need for increased investment in research and innovation, urging governments, industry, and international partners to support NASAC's efforts in capacity-building and knowledge exchange. He reaffirmed that through NASAC's initiatives, STI (Science, Technology, and Innovation) in Africa will not only contribute to addressing local challenges but also position the continent as a key player in the global knowledge economy.

2. **Synchrotron radiation facility, an essential characterization tool for STI**
   By Prof. Abderrahmane Tadjeddine, Member of AAST

   Prof. Tadjeddine introduced synchrotron radiation as a powerful tool for advancing Science, Technology, and Innovation (STI) in Africa. He explained that synchrotron radiation facilities provide high-intensity X-rays, enabling detailed analysis of materials at the atomic, molecular and nanoscale levels. This technology has wide-ranging

applications in fields such as medicine, materials science, environmental studies, and energy research. He stressed that Africa must invest in accessing such advanced scientific infrastructure to support cutting-edge research and innovation.

Prof. Tadjeddine highlighted the potential of synchrotron technology to drive breakthroughs in health diagnostics, renewable energy solutions, and industrial development. He called for stronger international partnerships to help African researchers gain access to synchrotron facilities worldwide and encouraged efforts to establish such infrastructure on the continent to foster local scientific excellence.

The opening speeches, goodwill messages and keynote addresses set a collaborative and forward-looking tone for AMASA 2024. The key messages centred on the critical role of STI in addressing Africa's developmental needs, and the necessity of international partnerships and collaboration. The importance of accessing advanced scientific infrastructure, such as synchrotron facilities, to drive innovation and sustainable development across the continent was also underscored. In a nutshell, the Opening Ceremony provided a platform for stakeholders to share ideas, network and create pathways to harness the full potential of Africa's resources through science, technology and innovation.

ENSURING ONE-HEALTH IN AFRICA: MATHEMATICAL, NUMERICAL, AND BIOTECHNOLOGICAL APPROACHES

Session Chair: *Prof. Irvy Gledhill* | **Session Rapporteur:** *Prof. Boudjema Samraoui*

1.1 Empowering Sickle Cell Disease Management and Research in DRC Using a Digital Health Platform

By Prof. Tshilolo Leon (DRC)

Prof. Tshilolo Leon presented a groundbreaking approach to improving the management and research of Sickle Cell Disease (SCD) in the Democratic Republic of Congo (DRC) using a digital health platform. He emphasised the challenges faced in DRC due to the high prevalence of SCD, limited access to healthcare, and a lack of centralised data for research and treatment. Prof. Leon introduced the digital health platform as a transformative solution that connects patients, healthcare providers and researchers, enabling real-time data collection, monitoring and management of SCD. This platform not only improves the quality of care by facilitating early diagnosis and personalised treatment plans but also empowers patients and families with vital information.

Additionally, the platform supports research by aggregating data to identify trends, treatment outcomes, and areas needing further intervention. Prof. Leon highlighted that this initiative is a crucial step towards scaling SCD management across Africa and fostering collaboration in global health research.

1.2 Panel Discussion on Addressing Global Issues with One Health

Moderator: *Dr. Oladoyin Odubanjo (Nigeria)*
Panelists: *Prof. Cheikh Ly (Senegal) and Dr. Chloe Ballesté-Delpierre (Spain)*

The panel discussion examined how the One Health approach can address global challenges by integrating human, animal and environmental health perspectives.

Prof. Cheikh Ly emphasised the importance of mathematical and numerical modeling in predicting and managing disease outbreaks, particularly zoonotic diseases that disproportionately affect Africa. He highlighted the need for cross-border collaboration and data-sharing to enhance disease surveillance and response.

Dr. Chloe Ballesté-Delpierre brought a unique perspective by discussing organ donation as a critical yet often overlooked component of One Health. She outlined its scientific and medical benefits, particularly in advancing research, improving transplantation success rates and addressing organ shortages in Africa. She

Panelists from left: *Prof. Irvy Gledhill, Prof. Boudjema Samraoui, Prof Cheikh Ly, Dr. Oladoyin Odubanjo,Dr Chloe Balleste-Delpierre and Prof. Tshilolo Leon*

emphasised the ethical considerations and the need for public awareness and policy frameworks to support organ donation initiatives. She also highlighted the responsibility to build multidisciplinary teams, with a particular focus on training ICU medical specialists in this emerging field.

The discussion reinforced the need for a multidisciplinary approach to health challenges, leveraging science, technology, and policy for sustainable solutions in Africa and beyond.

1.3 From Molecular Dynamics to Machine Learning: Exploring Conformational Disease through Multifaceted Computational Methods

By Prof. Robinson Musembi (Kenya)

Prof. Robinson Musembi discussed the application of advanced computational techniques, such as molecular dynamics and machine learning, to explore conformational diseases –disorders caused by misfolding or malfunction of proteins. He explained how molecular dynamics simulations allow researchers to study the behaviour of proteins at the atomic level, revealing insights into the structural changes that lead to diseases like Alzheimer's and Parkinson's. Prof. Musembi also highlighted how machine learning is being integrated into these studies to analyse vast amounts of data, predict protein behaviours and identify potential therapeutic targets more efficiently.

He emphasised the importance of combining these computational methods to accelerate the understanding of conformational diseases and streamline drug discovery processes. Prof. Musembi also touched on the potential of these technologies in Africa, where there is a growing need for innovative solutions to

healthcare challenges, and encouraged further collaboration in computational biology research across Africa.

1.4 African Gum Arabic: A Natural Biopolymer Revolutionising Pharmaceutical Nanotechnology

By Dr. Usri Ibrahim (Sudan)

Dr. Usri Ibrahim highlighted the transformative potential of African Gum Arabic as a natural biopolymer in pharmaceutical nanotechnology. He explained that Gum Arabic, widely sourced from Sudan and the Sahel region, has unique properties such as biocompatibility, stability and non-toxicity, making it ideal for drug delivery systems. Dr. Ibrahim showcased its role in enhancing the solubility and bioavailability of pharmaceutical compounds, particularly in nanomedicine applications. He also discussed its potential in controlled drug release, improving the efficacy of treatments for chronic diseases, including cancer and diabetes.

Furthermore, he emphasised the economic and scientific importance of promoting Africa's natural resources in global research and development. Dr. Ibrahim called for increased investment in value addition and collaboration between African scientists and the pharmaceutical industry to harness the full potential of Gum Arabic in advancing medical innovations.

1.5 Panel Discussion on The Value of AI approaches for One-Health

Moderator: Dr. Matlou Gauta (South Africa)
Panelists: Prof. Bi Crepin Pene (Côte d'Ivoire), Dr. Vanessa McBride (ISC-France), and Prof. Orlando Quilambo (Mozambique)

This panel discussion examined the growing role of Artificial Intelligence (AI) in strengthening the One Health approach by integrating human, animal and environmental health data.

Prof. Bi Crepin Pene highlighted AI's potential in disease surveillance and outbreak prediction, stressing how machine learning can analyse complex datasets to detect health threats early**.**

Dr. Vanessa McBride emphasised AI's role in enhancing global research collaboration and knowledge-sharing, accelerating the development of data-driven health solutions.

Prof. Orlando Quilambo discussed AI's impact in resource-limited settings, particularly in optimising diagnostics, improving healthcare efficiency, and tackling antimicrobial resistance.

The panelists acknowledged AI's transformative potential but stressed the need to address ethical concerns, data accessibility, and capacity-building. They called for stronger interdisciplinary collaboration to ensure that AI-driven technologies effectively address Africa's unique One Health challenges.

Panelists from left: *Prof. Irvy Gledhill, Prof Robinson Musembi, Dr. Vanessa McBride , Prof. Bi Crepin Pene, Prof. Orlando Quilambo and Dr. Usri Ibrahim*

Summary of Session 1

This session explored innovative scientific and technological solutions for advancing the One Health approach in Africa. Speakers and panelists highlighted the critical role of digital health platforms, computational methods, AI and natural biopolymers in addressing health challenges, alongside discussions on organ donation.

Key insights included:

- **Mathematical and Biotechnological Tools for Health:** The importance of predictive modeling for disease outbreaks was emphasised, while organ donation was discussed as a crucial aspect of global health solutions.
- **Technology-Driven Healthcare Solutions:** Digital health platforms that are revolutionising Sickle Cell Disease management was showcased as a way that can improve both patient care and research capabilities.
- **Computational Innovations for Medical Research:** Discussions highlighted the transformative role of molecular dynamics and AI in addressing conformational diseases, opening new avenues for breakthroughs in treating neurodegenerative disorders.
- **Harnessing Africa's Natural Resources:** The pharmaceutical potential of Gum Arabic was demonstrated, calling for investment in African biopolymers to strengthen local medical industries.
- **AI and One Health:** The panel discussion underscored AI's transformative potential in disease surveillance, research collaboration and healthcare optimisation while cautioning against ethical and data accessibility concerns.

Key Recommendations from Session 1

1. **Strengthen Collaboration** – Enhance partnerships between African institutions, global researchers and policymakers to drive impactful One Health initiatives.
2. **Invest in AI and Computational Methods** – Support AI-driven disease modeling, big data analytics and machine learning applications in healthcare.
3. **Expand Digital Health Platforms** – Scale up digital solutions for disease monitoring, patient management and research in Africa.
4. **Leverage Indigenous Resources** – Promote the value addition of African natural biopolymers like Gum Arabic in pharmaceuticals and nanotechnology.
5. **Develop Policies for Organ Donation** – Encourage policy frameworks and public awareness campaigns to facilitate ethical organ donation in Africa.
6. **Capacity Enhancement** – Train scientists, healthcare workers and policymakers to harness AI, biotechnology and computational tools for One Health.

The discussion during this session emphasised the fact that a multidisciplinary approach – combining AI, biotechnology and indigenous knowledge – is essential for addressing Africa's health challenges in a sustainable and impactful manner.

NATURAL HAZARDS AND THEIR IMPACT ON THE ENVIRONMENT AND HEALTH IN AFRICA

Session Chair: *Dr. Jackie Kado* | **Session Rapporteur:** *Dr. Zoubir Harrat*

2.1 Earthquake Damage in Africa: Urban Development and Perspectives for a Realistic Seismic Hazard and Risk Assessment

By Prof. Mustapha Meghraoui (Algeria)

Prof. Meghraoui addressed the escalating vulnerability of African urban centres to earthquake damage, emphasising the interplay between rapid urbanisation and insufficient seismic risk assessments. He said that while Africa is not traditionally recognised for high seismic activity, regions such as North Africa and the East African Rift System are susceptible to significant earthquakes.

To illustrate this point, he referenced notable seismic events, including:

- **1990 South Sudan Earthquakes:** A series of earthquakes, the largest being magnitude 7.2, struck near Juba, causing substantial damage to private housing and government institutions in Terakeka, approximately 60 km north of Juba.
- **2006 Machaze Earthquake in Mozambique:** A magnitude 7.0 earthquake occurred in Manica Province, resulting in four deaths and 36 injuries. It was the largest recorded earthquake in Mozambique and the first in southern Africa to have an identified surface rupture.
- **2023 High Atlas Earthquake in Morocco:** A magnitude 6.8 earthquake struck near Oukaïmedene, leading to more than 2,900 deaths and 5,500 injuries. This event underscored the region's seismic risks and the potential for significant human and economic losses.

Prof. Meghraoui emphasised that many African cities are expanding without adequate adherence to earthquake-resistant building codes, heightening the risk of catastrophic damage and loss of life. He advocated comprehensive seismic hazard assessments that integrate geophysical data, historical records and modern engineering solutions. Key strategies proposed included strengthening infrastructure, enforcing building regulations, enhancing public awareness, investing in early warning systems and fostering regional collaboration to bolster Africa's earthquake preparedness and response.

2.2 The Status of Disaster Risk Reduction in the African Continent

By Prof. Djillali Benouar (Algeria)

Prof. Benouar provided a comprehensive analysis of Africa's current disaster risk reduction (DRR) strategies, highlighting both progress and persistent challenges.

He emphasised that Africa remains highly vulnerable to natural disasters, including floods, droughts, cyclones and earthquakes, due to rapid urbanisation, weak infrastructure and limited early warning systems. Despite global frameworks such as the *Sendai Framework for Disaster Risk Reduction*, implementation across African nations has been inconsistent, with gaps in policy enforcement, data collection and cross-border collaboration. Prof. Benouar stressed the need for *integrated DRR strategies* that prioritise *climate resilience, community preparedness, and improved governance*.

He called for enhanced investment in disaster monitoring technologies and stronger enforcement of building codes. Additionally, Prof. Benouar stressed that greater collaboration between governments, scientific institutions and local communities is necessary to build long-term resilience. He concluded by urging African policymakers to *move from reactive responses to proactive risk management, ensuring that disaster preparedness becomes a cornerstone of sustainable development.*

2.3 Panel Discussion on Benefits of early warning systems for natural disasters

Moderator: Dr. Jaume Fortuny (Spain)
Panelists: Dr. Paco Sereme (Burkina Faso), Dr. David Niyukuri (Burundi), and Prof. Ishmael Masesane (Botswana)

This panel discussion explored the critical role of early warning systems (EWS) in mitigating the impact of natural disasters across Africa. The panelists highlighted how timely and accurate forecasting can significantly reduce loss of life, property damage and economic disruptions caused by disasters such as locust invasions, floods, droughts and cyclones.

Dr. Paco Sereme emphasised the importance of community-based early warning systems tailored to local realities, ensuring that vulnerable populations receive actionable information.

Dr. David Niyukuri discussed the integration of advanced technologies, such as AI and satellite data, in improving prediction models and disaster preparedness.

Prof. Ishmael Masesane focused on the policy and governance challenges, stressing the need for greater investment, regional collaboration and knowledge-sharing among African nations.

The discussion concluded with a call for enhanced funding, capacity-building and stronger coordination between governments, scientific institutions and local communities to make early warning systems more accessible, reliable and impactful.

2.4 The Mental Health Consequences of Health Emergencies in Africa: An Example of COVID-19 Pandemic

By Prof. Arouna Ouedraogo (Burkina Faso)

Prof. Ouedraogo discussed the severe mental health consequences of health emergencies in Africa, using the COVID-19 pandemic as a case study. He highlighted how the pandemic exacerbated stress, anxiety, depression and trauma, particularly among vulnerable populations such as frontline workers, COVID-19 survivors and those facing economic hardships. The talk emphasised the lack of mental health infrastructure and resources in many African countries, making it difficult to provide adequate support during and after crises. Prof. Ouedraogo also underscored the stigma surrounding mental health in African societies, which prevents many from seeking help.

To mitigate future impacts, he recommended integrating mental health into emergency response strategies, increasing public awareness and strengthening healthcare systems to provide accessible mental health services. He called for greater investment in psychological support programmes to build resilience in African communities facing health crises.

2.5 Mainstreaming Health in Climate Change Policy for Africa

By Dr. Deoraj Caussy (Mauritius)

Dr. Caussy's presentation started with an update of the study conducted by the NASAC Climate Change and Health Working Group, with significant support from the NASAC Executive Director, Dr. Jackie Kado (Kenya). He stressed the critical need to integrate health considerations into Africa's climate change policies, based on situation analysis in Africa. He illustrated that climate change poses significant risks to public health, including the spread of infectious diseases, food insecurity and malnutrition, which disproportionately affect vulnerable populations across the continent. He emphasised that policy frameworks must prioritise health in climate change mitigation and adaptation strategies to protect African communities. Additionally, he advocated for interdisciplinary approaches that bring together environmental scientists, healthcare professionals and policymakers to design sustainable solutions.

He concluded by recommending the strengthening of healthcare systems to cope with climate-induced health challenges and improving early warning systems for climate-related health threats. He also emphasised the need for inclusive, evidence-based policies that support the health and well-being of Africa's populations in the face of climate change.

2.6 Panel Discussion on Research Opportunities in Natural Hazards

Moderator: Dr. Nimir Elbashir (Sudan)
Panelists: Dr. Justine Germo Nzweundji-Khumbah (Cameroon), Dr. Asifa Nanyaro (Tanzania)

This panel explored emerging research opportunities in the study of natural hazards in Africa, emphasising the need for multidisciplinary approaches to enhance disaster preparedness and resilience.

Dr. Asifa Nanyaro highlighted the importance of data-driven risk assessments and climate modeling to better predict and mitigate natural disasters. He emphasised the need for investment in research infrastructure and regional collaboration to strengthen Africa's capacity to address environmental threats.

Dr. Justine Germo Nzweundji-Khumbah introduced a crucial perspective on indigenous knowledge systems, stressing that traditional knowledge, passed down through generations, offers valuable insights into environmental changes. She advocated for integrating indigenous wisdom with empirical scientific approaches in decision-making to create more holistic, locally relevant solutions for natural hazard management.

The panelists agreed that bridging traditional and modern scientific knowledge could lead to more effective, community-driven responses to natural hazards. They called for greater inclusion of local voices in policy discussions and enhanced research funding to explore the intersections between cultural heritage and scientific innovation in disaster risk reduction.

Summary of Session 2

This session examined the impact of natural hazards on Africa's environment and public health, with a focus on earthquake risk, disaster preparedness, early warning systems and climate-related health challenges. Discussions also emphasised the role of indigenous knowledge in disaster risk reduction and the need for stronger integration of health considerations into climate policies. Experts stressed the importance of science-driven risk assessments, technology-enabled disaster response, and interdisciplinary collaboration.

Key insights included:

- **Seismic Hazards and Risk Assessment:** Africa's earthquake-prone regions require realistic seismic hazard assessments to guide urban development and risk mitigation. Recent earthquakes, such as the 2023 High Atlas event, highlight the urgency of integrating scientific modeling and infrastructure resilience into policy frameworks.
- **Disaster Risk Reduction (DRR) Challenges:** While many African nations have DRR policies, implementation gaps remain due to limited resources, weak institutional

coordination and lack of community engagement. Strengthening national and regional DRR strategies is crucial.

- **The Role of Early Warning Systems:** The experts stressed that early warning systems (EWS) are life-saving tools, yet accessibility and effectiveness remain uneven across the continent. Investments in AI, real-time data monitoring and community education can improve response to natural disasters.
- **Health Implications of Natural Hazards:** Climate change and extreme weather events worsen public health challenges, including mental health crises following disasters. The COVID-19 pandemic exposed gaps in mental health support, making it essential to integrate mental well-being into emergency preparedness plans.
- **Bridging Science and Indigenous Knowledge:** A call was made for incorporating traditional knowledge systems into disaster risk reduction strategies. Indigenous communities possess valuable ecological and environmental insights that can complement scientific models.

Key Recommendations from Session 2

1. **Strengthen Risk Assessment and Preparedness** – Invest in realistic seismic hazard mapping, resilient infrastructure and community-driven disaster planning.
2. **Improve Disaster Management Systems** – Enhance cross-border collaboration, governance frameworks and funding for disaster risk reduction.
3. **Advance Early Warning Technologies** – Expand the use of AI, remote sensing and mobile-based alerts for timely disaster warnings.
4. **Integrate Climate-Health Strategies** – Strengthen healthcare resilience, emergency response mechanisms and mental health support in disaster management policies.
5. **Foster Science-Indigenous Knowledge Partnerships** – Promote collaborative research that values indigenous wisdom in environmental conservation and disaster adaptation.

Session 2 concluded with a consensus that science, technology, policy and community engagement must work in synergy to build a more disaster-resilient Africa.

MOBILISATION OF SKILLS AND POOLING OF SCIENTIFIC AND TECHNOLOGICAL RESOURCES IN AFRICA

Session Chair: Prof. *Abdelfattah Badr* | **Session Rapporteur:** *Prof. Khedidja Allia*

3.1 Networking and Pooling of Resources for Promoting Postgraduate Training and Research in Africa

By Prof. Goolam Mohamedbhai (Mauritius)

Prof. Mohamedbhai emphasised the urgent need for collaborative efforts to strengthen postgraduate training and research in Africa. He highlighted that while African universities produce a growing number of graduates, many face limited access to quality postgraduate education and research infrastructure. To address this, he advocated for resource pooling, where institutions share expertise, facilities and funding to bridge capacity gaps. He pointed out successful models, such as regional research networks and joint postgraduate programmes, which have proven effective in enhancing scientific output and knowledge transfer. He stressed the importance of leveraging international partnerships while ensuring that African institutions maintain ownership of their research priorities.

Prof. Mohamedbhai concluded by urging African governments, universities and private sector stakeholders to invest in postgraduate education, create more funding mechanisms and strengthen intra-African academic collaborations to drive sustainable development through research and innovation.

3.2 Building a Trustworthy Research Environment: Challenges and Solutions to Predatory Publishing

By Ms. Susan Veldsman (South Africa)

Ms. Veldsman addressed the growing threat of predatory publishing in Africa's research landscape, highlighting its harmful impact on academic integrity and the credibility of African scholarship. She explained how these deceptive publishers exploit researchers, particularly early-career academics, by charging high fees for low-quality or non-peer-reviewed publications. She emphasised that the rise of predatory journals undermines scientific progress, misleads policymakers and wastes valuable research funding. To combat this, she called for greater awareness, robust institutional policies and researcher training on identifying credible journals. She also stressed the role of academic databases, journal accreditation systems and open-access initiatives in safeguarding research integrity.

Ms. Veldsman concluded by advocating for regional and international collaborations to strengthen research ethics, promote transparency in publishing and protect

African scholars from exploitation, ensuring that African research gains global recognition and impact.

3.3 Energy Development and Technology Transfer for THE ACCELERATION of Regional Integration

By Dr. Mohamed Khodja (Algeria)

Dr. Khodja explored the crucial role of energy development and technology transfer in fostering regional integration across Africa. He emphasised that sustainable energy solutions are key to economic growth, social stability, and industrialisation on the continent. He highlighted the uneven distribution of energy resources and the need for regional cooperation to optimise energy access. He pointed out that technology transfer, particularly in renewable energy (solar, wind and hydroelectric power), can help bridge the energy gap and reduce Africa's dependence on fossil fuels. Dr. Khodja underscored the importance of policy harmonisation, investment in energy infrastructure and knowledge-sharing among African nations to ensure efficient energy distribution.

Dr. Khodja called for stronger public-private partnerships and regional frameworks to facilitate energy trade and innovation. He concluded by urging African governments to prioritise energy security, enhance technical capacity and foster intra-African collaboration to drive sustainable development and integration. With Africa's energy demand expected to more than double by 2040, addressing energy security and technological mastery is vital.

3.4 Panel Discussion on Effective Human Resource Development Strategies for Africa

Moderator: Prof. Kalulu Taba (DRC)
Panelists: Prof. Samia Benabbas (Algeria), Prof. Sammy Chumbow (Cameroon), Prof. Olusola Bendele Oyewole (Nigeria) and Mr. Adel Hadji (*Huawei* - Algeria)

Panel Discussion on Effective Human Resource Development Strategies for Africa. The discussions focused on strategies for developing human resources in Africa to address the continent's most pressing challenges. The panelists highlighted the critical role of education, skills development and capacity building in fostering a knowledgeable and innovative workforce.

Prof. Samia Benabbas emphasised the importance of integrating technological and scientific advancements into educational curricula. She stressed the need for interdisciplinary approaches in higher education to equip graduates with the skills needed for Africa's rapidly evolving industries.

Prof. Sammy Chumbow discussed the role of universities and research institutions in fostering innovation through collaboration with industries. He advocated for stronger partnerships between academic institutions and the private sector to ensure that graduates are ready to meet the demands of the labour market.

Prof. Olusola Bendele Oyewole focused on the importance of investing in youth empowerment and leadership development. He suggested that Africa's youthful population could be a significant asset if adequately trained, particularly in STEM fields, which are crucial for Africa's sustainable development.

Mr. Adel Hadji brought a corporate perspective to the discussion, emphasising the importance of the private sector in driving human resource development. He highlighted Huawei's role in supporting skill development through training initiatives and partnerships with academic institutions, particularly in the fields of ICT and technology, which are central to Africa's digital transformation.

The panelists collectively agreed that building human capacity in Africa requires a multifaceted approach, including strengthening vocational training, increasing access to quality education, promoting women and youth in science and technology, and creating an environment where innovation can thrive. They also called for increased investment in education and human capital development to ensure Africa's competitiveness in the global economy.

3.5 Personalised Medicine or When Diversity Brings People Together

By Prof. Habiba Bouhamed Chaabouni (Tunisia)

Prof. Chaabouni explored the exciting advances in biotechnology, particularly in genome sequencing, and their application to personalised medicine. She highlighted how biotechnology's ability to map and record individual genomes is revolutionising healthcare by enabling treatments tailored to a person's unique genetic makeup. This approach promises more effective treatments, especially for complex diseases, by considering genetic diversity and individual responses to medications. Prof. Chaabouni also emphasised the role of diverse genetic research in advancing healthcare solutions, stressing that inclusiveness in genomic studies ensures that personalised medicine is accessible and effective for populations across Africa and globally.

She underscored the importance of integrating personalised medicine into public health strategies to improve outcomes, particularly for regions with high genetic diversity. By leveraging biotechnology, the promise of personalised medicine is not just theoretical but increasingly within reach, offering the potential to transform healthcare in Africa. She emphasised the importance of regional and continental collaboration for rapid scientific and medical progress.

3.6 Promoting Scientific Diplomacy for a More Balanced and Collaborative Scientific Landscape in Africa

By Dr. Clotaire Nana Djeunga (Cameroon)

Dr. Djeunga delivered a compelling talk on the importance of scientific diplomacy in fostering a more collaborative and balanced scientific landscape in Africa. He discussed how scientific diplomacy can bridge gaps between African countries

and the global scientific community, facilitating more effective partnerships and resource sharing. Dr. Djeunga also highlighted the role of the "*Science Diplomacy in Africa*" incubator, a platform aimed at nurturing young African scientists and promoting cross-border collaborations in science and technology. He emphasised that scientific diplomacy is key to addressing the continent's challenges, particularly in resource mobilisation, policy advocacy and international cooperation. By promoting open dialogue and strengthening networks of African researchers, scientific diplomacy can play a pivotal role in driving sustainable development and positioning Africa as a global leader in science and technology.

3.7 New technological research tools for the improvement of innovation

By Prof. Azzedine Lounis (Algeria)

Prof. Lounis presented on the latest technological research tools aimed at enhancing innovation. He explored how emerging technologies, such as advanced computational methods, artificial intelligence and nanotechnology, are transforming research and development across various sectors. Prof. Lounis emphasised the critical role these tools play in accelerating breakthroughs in fields such as healthcare, energy and environmental sustainability. He also discussed the importance of fostering a culture of innovation through the integration of these technologies into research environments, enabling researchers to address Africa's unique challenges more effectively. Prof. Lounis highlighted that the successful application of these tools will not only improve the pace of scientific discoveries but also facilitate their commercialisation, ensuring that innovation leads to tangible economic benefits for the continent's development.

3.8 Panel Discussion on Brain Circulation in a Global Village

Moderator: Prof. Yohannes Teketel (Ethiopia)
Panelists: Ms. Federica Irene Falomi (UN Technology Bank - Turkey), Prof. Noureddine Benali-Cherif (Algeria), and Prof. Godfrey Biemba (Zambia)

In this panel discussion, the concept of "Brain Circulation" was reframed as "*Scientists Mobility*" to more accurately reflect the movement of skilled human resources across borders. Panelists explored the implications of mobility for Africa's scientific development.

Ms. Federica Irene highlighted the importance of international collaboration in advancing innovation, while **Prof. Noureddine Benali-Cherif** emphasised strategies for retaining talent while benefiting from global exposure.

Prof. Godfrey Biemba shared insights on how scientists' mobility *(as opposed to brain drain or brain circulation)* presents both opportunities and challenges for Africa. He advocated for a balanced approach that maximises benefits while addressing potential drawbacks.

Prof. Biemba further proposed that NASAC should prepare a proposal for funding by international organisations like UNESCO, ILO and the World Bank to develop an "International Platform on ***Scientists' Global Mobility***. This platform would provide a database of mobility metrics to inform policies at both the African and global levels, helping to maximise the benefits of scientists' mobility while mitigating its adverse effects.

Summary of Session 3

This session focused on strategies for enhancing Africa's scientific and technological capabilities through effective human resource mobilisation and the pooling of resources. Speakers discussed the importance of collaborative efforts to promote postgraduate training, tackle challenges in research publishing, develop energy technologies and use personalised medicine to advance healthcare. There was a strong emphasis on the need for Africa to harness its human resources and scientific potential to foster regional integration and innovation.

The main insights included:

- **Mobilisation of Skills and Resources:** The session highlighted the need to harness Africa's scientific and technological expertise to address the continent's challenges, emphasising the importance of pooling resources and promoting postgraduate training.
- **Credibility in Research:** It was stressed that building a trustworthy research environment is crucial to combat issues like predatory publishing, which can undermine the credibility of African research and its international standing.
- **Energy Development:** The session discussed the importance of advancing energy technologies and accelerating regional integration, especially in the context of rising energy demand and the need for technological mastery to ensure energy security.
- **Personalised Medicine:** Advances in biotechnology, particularly genome recording and its application in personalised medicine, were presented as a way to improve health outcomes, particularly in diverse African populations.
- **Science Diplomacy:** The session also underscored the role of science diplomacy in fostering a collaborative and balanced scientific landscape in Africa, promoting international cooperation through shared scientific goals.

Key Recommendations from Session 3

1. **Enhance Human Resource Development:** Build stronger partnerships between universities, governments and industries to improve postgraduate training and retention of scientific talent within Africa.

2. **Address Predatory Publishing:** Establish guidelines and frameworks to combat predatory publishing practices and ensure the credibility of African research.
3. **Strengthen Technological Mastery in Energy:** Invest in energy technologies and integrate regional solutions to address energy security, focusing on sustainable energy development.
4. **Foster Personalised Medicine:** Support biotechnology and genomic research to develop personalised medicine solutions that address the specific health needs of African populations.
5. **Promote Scientific Resource Pooling:** Create platforms and initiatives that allow African countries to pool scientific and technological resources, enhancing collaboration and enabling shared progress in research and innovation.

CLOSING CEREMONY

The closing ceremony of AMASA 2024 was marked by heartfelt and delightful speeches from the Presidents of NASAC, Prof. Norbert Hounkonnou, and AAST, Prof. Mohamed Kara. The Executive Director of NASAC, Dr. Jackie Kado, also took the opportunity to give a vote of thanks and announce the venue for AMASA 2025.

The President of NASAC expressed deep appreciation for the success of AMASA 2024, emphasising the importance of the event in advancing scientific collaboration across Africa. He highlighted the valuable discussions and presentations on critical topics such as energy, natural hazards, health challenges and technological innovations that were central to the conference. Acknowledging the contributions of all participants, the President of NASAC underscored the need to build on these discussions for the future of African science and technology. He concluded by conveying gratitude to the host country, Algeria, for its hospitality and for facilitating such a successful gathering

The President of AAST also extended heartfelt appreciation to all delegates, speakers and panelists for their active participation and contribution to the success of AMASA 2024. He emphasised that the collaboration between different African countries, institutions and international partners throughout the event would have lasting benefits for the African scientific community. The President of AAST particularly acknowledged the role of the scientific community in tackling Africa's most pressing challenges, such as climate change, health crises and energy security. He concluded his remarks by reaffirming the commitment of AAST to continue fostering partnerships with other academies in Africa so as to address the continent's development challenges.

The Executive Director of NASAC gave a vote of thanks as well, extending sincere gratitude to all participants, organisers and partners who contributed to the success of the conference. She underscored the significant contributions made by the members of the Scientific Committee and the Organising Committee. She went on to congratulate and express the deepest appreciation to each member of these committees by name, and their most notable personality traits that made organising the event with them a delightful adventure.

The speeches concluded with an optimistic outlook on the future of African science and technology, emphasising collaboration, innovation and a shared vision for a thriving continent. Participants were informed that AMASA 2025 was set to be hosted by the Tunisian Academy of Sciences, Letters and Arts (Beit al-Hikma), with Prof. Kamel Barkaoui affirming the academy's commitment to this possibility. He stated that official confirmation and further details would be provided by early 2025. Prof. Barkaoui also highlighted that the upcoming event would build on the momentum of AMASA 2024, providing another vital platform for African academies to unite their voices around a common thematic focus.

SIDE EVENT 1:
Learning Collaborative on Maintaining Financial Sustainability With Independence: Empowering Academies of Science and Universities as Catalysts for Development

Venue: International Conference Centre (ICC) in Algiers, Algeria
Date and Time: 25 November 2024, 14:00 – 17:00 UTC
Organisers: NASAC, OBREAL Global, United Nations Technology Bank for the Least Developed Countries (UNTB), InterAcademy Partnership (IAP), and the Algerian Academy of Science and Technology (AAST), with the support of the African Union Commission, the Association of African Universities, and the Pan African University.

Participants at the event

The AMASA 2024 side event on "***Maintaining Financial Sustainability with Independence: Empowering Academies of Science and Universities as Catalysts for Development***" convened key stakeholders to discuss strategies for strengthening the financial resilience of scientific institutions in Africa. The session highlighted the pressing need for academies and universities to secure sustainable funding while maintaining their autonomy. The presenters underscored that financial sustainability is not just about resource mobilisation but also about ensuring credibility, stability, and long-term impact in advancing scientific research and policy influence.

A major focus of the discussion was on diversifying funding sources to reduce over-reliance on government and donor funding. Experts shared successful models where science academies and universities have established endowments, built strategic partnerships with industry, and leveraged consultancy services to generate income. The importance of engaging the private sector, philanthropists, and

From right: *Moses Ogutu – Study Co-Director IAP, Asli Hekimoglu – Programme Officer UNTB, Dr. Florence Wambugu – Africa Harvest CEO, Dr. Doyin Odubanjo of NAS and Prof. Olusola Bandele Oyewole – Secretary General AAU*

international funding agencies was emphasised as a way to foster long-term financial independence. Additionally, participants explored the potential of innovative financing mechanisms, such as impact investing and public-private partnerships, to support scientific research and capacity building.

Ms. Federica Falomi, Economic Affairs Officer UNTB

Challenges hindering financial sustainability were also discussed, including restrictive funding policies, bureaucratic inefficiencies, and limited grant management expertise within African institutions. Many participants highlighted the difficulty of balancing financial independence with accountability, particularly when engaging with corporate funders. Strengthening governance structures and financial management systems within academies and universities was proposed as a key solution to enhance transparency, efficiency, and strategic decision-making. The session also explored the role of policy advocacy in ensuring an enabling environment for sustainable financing. Participants called on governments to allocate dedicated budgets for scientific institutions and create legal frameworks that allow them to engage in revenue-generating activities without compromising their integrity. Strengthening regional collaboration was also seen as essential, with suggestions for joint resource mobilisation efforts and knowledge-sharing platforms that could help institutions navigate funding challenges collectively.

Prof. Florence Wambugu, Executive Officer Africa Harvest Biotechnology Foundation

In conclusion, the side event reinforced that achieving financial sustainability with independence requires a multi-faceted approach, combining strategic partnerships, innovative funding models, and strong institutional governance. Empowering academies of science and universities with the financial means to operate independently is critical for their role as catalysts for Africa's development. The discussions emphasised the need for continued engagement among stakeholders to develop actionable strategies that ensure scientific institutions remain both financially resilient and true to their core mission of advancing knowledge and evidence-based policy.

Moses Ogutu, Study Co- Director IAP

SIDE EVENT 2:
Harnessing Open Science for One Health and Natural Hazards Resilience in Africa

Venue: The Sheraton Club des Pins Resort - Hôtel, Algiers, Algeria
Date and Time: 28 November 2024, 11:00 - 13:00 UTC
Host: Algerian Academy of Science and Technology (AAST)
Organisers: AAST, African Open Science Platform (AOSP), CODATA, NASAC, and Periperi U

The AMASA 2024 Side Event on "***Harnessing Open Science for One Health and Natural Hazards Resilience in Africa***" brought together experts, policymakers and researchers to explore the role of Open Science in addressing health and environmental challenges on the continent. The session underscored the importance of Open Science in improving data sharing, fostering collaboration and enabling evidence-based decision-making to tackle complex, interconnected issues such as zoonotic diseases, climate-induced disasters and biodiversity loss. Participants emphasised that leveraging Open Science principles could enhance Africa's ability to anticipate, mitigate and respond to emerging health and environmental risks.

Discussions highlighted key initiatives promoting Open Science, including regional data-sharing platforms, open-access repositories and interdisciplinary research networks. Case studies demonstrated how Open Science has supported disease surveillance, disaster preparedness and resource optimisation, particularly in under-resourced settings. The presenters stressed that democratising access to scientific knowledge can bridge the gap between research and policy implementation, ensuring that scientific advancements translate into tangible societal benefits.

Despite the potential of Open Science, the session also addressed significant barriers, including limited infrastructure, data governance challenges and concerns about intellectual property rights. Participants called for greater investment in digital infrastructure, capacity-building programmes and policies that facilitate equitable data sharing across institutions and borders. The importance of ethical considerations, including data security and community engagement, was also highlighted as essential for maintaining trust and inclusivity in Open Science practices.

The discussions reinforced the need for stronger regional and international collaboration to maximise the impact of Open Science in Africa. Participants advocated for multi-stakeholder partnerships involving governments, academic institutions, private sector actors and civil society to drive policy reforms and ensure sustainable implementation. Additionally, enhancing scientific literacy and awareness among decision-makers and local communities was identified as crucial for fostering a culture of Open Science that benefits all.

In conclusion, the side event reaffirmed that Open Science is a powerful tool for strengthening Africa's resilience to health and environmental challenges. By prioritising

transparency, accessibility, and collaboration, Africa can harness the full potential of scientific knowledge to drive sustainable solutions for One Health and natural hazards resilience. The event underscored the urgency regarding domestication and implementation of the UNESCO recommendations, including through relevant institutional and policy support and to embed Open Science into continental, national and regional strategies, ensuring long-term impact and meaningful progress in addressing pressing societal challenges. The ongoing Science, Technology and Innovation Strategy for Africa (STISA2034) provides an avenue for accelerating transition to open science in Africa through concrete actions to promote support for implementation of open science across disciplines and communities. To this end, Academies of Science are key stakeholders in this transition

LAUNCH 1: The Decarbonisation Report

Session Overview: The launch of the *Decarbonisation of Transport in Africa: Opportunities, Challenges and Policy Options* report took place during the 2024 AMASA conference in Algiers, Algeria, in a 90-minute session. The theme of the session was *'Decarbonisation of Transport in Africa: Resilience, Technology, Innovation, and Policy.'* The session focused on the findings of the joint report published by the Network of African Science Academies (NASAC) and the InterAcademy Partnership (IAP).

Launch Highlights: The session commenced with a brief overview of the report, which addresses the urgent need for sustainable transport solutions across the African continent. The report identifies opportunities, challenges, and policy options aimed at reducing carbon emissions in Africa's transport sector while promoting resilience, technology adoption, and innovation.

Members of the Decarbonisation Working Group also presented the key recommendations from the report, emphasising the role of collaborative action, investment in clean transport technologies and the importance of aligning transport policies with broader climate and development goals. These recommendations are essential for creating a sustainable and decarbonised transport system in Africa.

Decarbornisation Working Group Members handing over the Report and Summary to the Presidents of NASAC and AAST

Key stakeholders, including policy experts, academics and practitioners, participated in the session, engaging in discussions around the report's findings and recommendations. The session highlighted the importance of collaborative efforts among African nations, technology developers and policymakers to create scalable solutions for the decarbonisation of transport.

Report Dissemination: Following the presentation, the report was officially launched and disseminated in person to attendees. Copies of the report were made available, providing participants with valuable insights into the current state of the transport sector and practical steps for achieving decarbonisation in the region.

Collaborative Effort and Funding: This project is a collaborative effort between NASAC and IAP, with funding support from the Africa Climate Foundation (ACF) in South Africa and ClimateWorks Foundation in the USA. Their support has been instrumental in enabling this critical research and facilitating the convening of the Working Group to develop actionable policy recommendations.

Conclusion: The launch of the report at AMASA 2024 was an important milestone in advancing the conversation around sustainable transport solutions in Africa. It highlighted the critical role of innovation, technology and sound policy in achieving a decarbonised transport system that is both resilient and adaptable to the continent's diverse needs.

REPORT LAUNCH 2: The Statements on Gene Editing Technology

Session Overview: A second session was held at AMASA 2024 in Algiers, Algeria, to launch the Statements on Gene Editing Technology, signed by NASAC members. The target audiences for these statements included policymakers, researchers, regulators and the public. The session presented key highlights from the statements, with experts from the Gene Editing Technology Initiative offering insights into the document's implications and importance. This initiative was a collaboration between the Network of African Science Academies (NASAC) and Africa Harvest, with financial support from CropLife International.

Launch Highlights: The session began with an introduction to the Statements on Gene Editing Technology, which address the critical role of gene editing in advancing agricultural development in Africa. The statements focus on the ethical considerations, regulatory frameworks and scientific perspectives needed to guide the use of gene editing technologies, particularly in enhancing food security and sustainability.

Gene Editing Technology Working Group Members handing over the Statements to the Presidents of NASAC and AAST

Experts from the Gene Editing Technology Initiative provided an overview of the key highlights from the statements, emphasising the potential of gene editing to address challenges such as climate change, crop diseases, and the growing need for higher agricultural yields in Africa. The experts also discussed the importance of regulatory frameworks that ensure the safe and responsible application of gene editing technologies across the continent.

Audience Engagement: The session was interactive, encouraging dialogue between experts and attendees. Participants engaged in discussions about the implementation of gene editing technologies and the necessary steps to foster an enabling environment for their adoption in Africa. Public engagement was highlighted as necessary for increased awareness and understanding of gene editing technologies.

Conclusion: The launch of the Statements on Gene Editing Technology at AMASA 2024 underscored the significance of gene editing as a transformative tool for African agriculture. The session provided a platform for important discussions on the ethical, regulatory and scientific aspects of gene editing, ensuring that the statements resonate with key stakeholders across Africa. The collaboration between NASAC, Africa Harvest and CropLife International will continue to drive efforts in advancing gene editing technology to improve food security and sustainability on the continent.

CONCLUSION

AMASA 2024 marked a significant milestone in advancing Africa's scientific and technological agenda through collaboration, innovation and knowledge sharing. Over the course of the event, participants engaged in thought-provoking discussions on mobilising skills and pooling resources to strengthen Africa's research ecosystem, enhance regional integration and drive sustainable development. The conference underscored the critical role of science academies in shaping policy, fostering partnerships and advocating for increased investment in research and development.

The key takeaways from AMASA 2024 reaffirmed the need for Africa to harness its scientific potential by strengthening higher education, promoting open science and leveraging emerging technologies. Discussions highlighted the importance of addressing challenges such as brain drain, predatory publishing and limited access to funding and infrastructure. The event also emphasised the role of science diplomacy in fostering global collaborations and ensuring Africa's voice is represented in international scientific dialogues.

As AMASA 2024 concluded, a strong commitment emerged to implement the recommendations set forth during the discussions. The science academies, policymakers and stakeholders pledged to take concrete actions to enhance research capacity, support scientists' mobility and develop sustainable policies that drive innovation and economic growth.

Looking ahead, AMASA 2025 will build on the progress achieved during this event. With confirmation of details expected in early 2025, the upcoming gathering will serve as another crucial platform for African academies to align their efforts, unify their voices and work collectively toward a thriving and self-sustaining scientific ecosystem.

APPENDICES

APPENDIX I: PROGRAMME

TIME	ACTIVITY	FACILITATORS
DAY 0: MONDAY, 25 NOVEMBER 2024		
ALL DAY	**REGISTRATION**	**NASAC**
10.00 – 13.00	**NASAC Board Meeting**	(NASAC Board members only)
14.00 – 17.00	**First Side Event** **Learning Collaborative – Maintaining Financial Sustainability with Independence** Empowering Academies of Science and Universities as Catalysts for Development NASAC | AAST | UNTB | OBREAL | IAP	
17.00 –18.00	**All participants are invited to a cocktail reception "Icebreaker"**	
DAY 1: TUESDAY, 26 NOVEMBER 2024		
OPENING CEREMONY **Chair:** Dr. Mohamed Khodja, Vice-President AAST, SONATRACH/API		
09.00	(i) National Anthem (Kassaman) of Algeria (ii) Welcome Speeches • **Prof. M.H. Kara,** *President, AAST and Co-Chair of AMASA–2024 (15')* • **Prof. M.N. Hounkonnou,** *President, NASAC and Co-Chair of AMASA–2024 (10')* • **Prof. M. Belhocine,** *Commissioner for Science & Technology at the African Union Commission (15')* (iii) Goodwill messages from Partners • **Dr. Erik Hansalek** – *Head of Division, Cooperation with Africa and the Middle East, German Federal Ministry of Education and Research (BMBF) (3')* • **Prof. M. Allab** – *Immediate President, AAST (3')* • **Prof. M. Awartani** – *President, Palestinian Academy of Science and Technology (PAST) (3')*	
09.50	**OFFICIAL OPENING SPEECH**	
10.00	**First Keynote Address** The Role of STI in Achieving the SDGs in Africa	**Prof. M.N. Hounkonnou,** *President of NASAC*
10.30	**Second Keynote Address** Synchrotron radiation facility, an essential characterisation tool for science, innovation and technology.	**Prof. Abderrahmane Tadjeddine** *Member of AAST*
11.00	**GROUP PHOTO**	**AAST**
11.15	**HEALTH BREAK**	
SESSION ONE **Ensuring One Health in Africa: Mathematical, Numerical and Biotechnological Approaches** **Chair:** Prof. Igle Gledhill + **Rapporteur:** Prof. Boudjéma Samraoui		
11.30	Empowering Sickle Cell Disease Management and research in DRC by using a digital health platform	**Prof. Tshilolo Léon** (DRC)
11.45	Are we eating Poison? Exploring the Links Between Agricultural Productivity, Food Security, Public Health and Science	**Prof. Elizabeth Bandason** (Malawi)
12.00	**Panel Discussion** Addressing global issues with One-Health • Dr. Nkansah Marian Asantewah (Ghana) • Prof. Cheikh Ly (Senegal) • Dr. Chloe Ballesté-Delpierre (Spain)	**Dr. Doyin Odubanjo** (Nigeria)

TIME	ACTIVITY	FACILITATORS
12.45	**Q&A SESSION**	
13.15	**LUNCH BREAK**	
14.15	From Molecular Dynamics to Machine Learning: Exploring Conformational Diseases through Multifaceted Computational Methods	**Prof. Robinson Musembi** (Kenya)
14.30	African Gum Arabic: A Natural Biopolymer Revolutionising Pharmaceutical Nanotechnology	**Dr. Usri Ibrahim** (Sudan)
14.45	**Panel Discussion** Value of AI approaches for One-Health • Prof. Bi Crépin Pene (Cote d'Ivoire) • Dr. Vanessa McBride (France) • Prof. Orlando Antonio Quilambo (Mozambique)	**Dr. Matlou Gauta** (South Africa)
15.15	**Q&A SESSION**	
15.30	**90-minute session** **Launch of Decarbonisation Report** Decarbonisation of Transport in Africa: Resilience, Technology, Innovation and Policy	
17.00	**HEALTH BREAK**	
18.30 – 20.00	**Sponsored Dinner**	**Gene Editing Technology Initiative** (CropLife International & Africa Harvest)
DAY 2: WEDNESDAY, 27 NOVEMBER 2024		
SESSION TWO **Natural hazards and their impact on the environment and health in Africa** **Chair:** Dr. Jackie Kado + **Rapporteur:** Dr. Zoubir Harrat		
09.00	Earthquake Damage in Africa: Urban Development and Perspectives for a Realistic Seismic Hazard and Risk Assessment	**Prof. Mustapha Meghraoui** (Algeria)
09.15	The Status of Disaster Risk Reduction in the African Continent	**Prof. Djillali Benouar** (Algeria)
09.30	**Panel Discussion** Benefits of early warning systems for natural disasters • Dr. Paco Sereme (Burkina Faso) • Dr. David Niyukuri (Burundi) • Prof. Ishmael Masesane (Botswana)	**Dr. Jaume Fortuny** (Spain)
10.00	**Q&A SESSION**	
10.15	**HEALTH BREAK**	
10.30	Conséquences sur la santé mentale des urgences sanitaires en Afrique: exemple de la pandémie à Covid-19	**Prof. Arouna Ouedraogo** (Burkina Faso)
10.45	Mainstreaming health in climate change policy for Africa	**Prof. Deoraj Caussy** (Mauritius)
11.00	**Panel Discussion** Research Opportunities in Natural Hazards • Dr. Gladys Kianji (Kenya) • Justine Germo Nzweundji-Khumbah (Cameroon) • Dr. Asifa Nanyaro (Tanzania)	**Prof. Nimir Elbashir** (Sudan)

TIME	ACTIVITY	FACILITATORS
11.30	**Q&A SESSION**	
	SESSION THREE **Mobilisation of Skills and Pooling of Scientific and Technological Resources in Africa** **Chair:** Prof. Abdelfattah Badr + **Rapporteur:** Khedidja Allia	
11.45	Networking and Pooling of Resources for Promoting Postgraduate Training and Research in Africa	**Prof. Goolam Mohamedbhai** (Mauritius)
12.00	Building a Trustworthy Research Environment: Challenges and Solutions to predatory Publishing	**Ms. Susan Veldsman** (South Africa)
12.15	Développement énergétique et transfert technologique pour l'accélération de l'intégration régionale	**Dr. Khodja Mohamed** (Algeria)
12.30	**Panel Discussion** Effective human resource development strategies for Africa • Prof. Samia Benabbas (Algeria) • Prof. Sammy Chumbow (Cameroon) • Prof. Olusola Bandele Oyewole (Nigeria)	**Prof. Kalulu Taba** (DRC)
13.00	**Q&A SESSION**	
13.15	**LUNCH BREAK**	
14.00	Personalised medicine or when diversity brings people together	**Prof. Habiba Bouhamed Chaabouni** (Tunisia)
14.15	Promoting Scientific Diplomacy for a more balanced and collaborative scientific landscape in Africa	**Prof. Clotaire Nana Djeunga** (Cameroon)
14.30	Les nouveaux dispositifs de la recherche technologique pour la croissance de l'innovation	**Prof. Azzedine Lounis** (Algeria)
14.45	**Panel Discussion** Brain circulation in a global village • Ms. Federica Irene Falomi (Turkey) • Prof. Noureddine Benali-Cherif (Algeria) • Prof. Godfrey Biemba (Zambia)	**Dr. Yohannes Teketel** (Ethiopia)
15.15	**Q&A SESSION**	
15.45	**HEALTH BREAK**	
	CLOSING CEREMONY	
16.30	1. Rapporteurs Report 2. Closing statement by AAST 3. Closing statement by NASAC 4. **AMASA 2025 handing over session:** From Algerian Academy of Science and Technology (AAST) to Tunisian Academy of Sciences, Letters and Arts (Beit al-Hikma) 5. Vote of Thanks	1. **Chief Rapporteur** 2. **Prof. M.H. Kara** 3. **Prof. M.N. Hounkonnou** 4. **Prof. K. Barkaoui** 5. **Dr. Jackie Kado**
17.30	**REST**	
18.30 –22.00	**OFFICIAL GALA DINNER (Traditional meal)**	

TIME	ACTIVITY	FACILITATORS
	DAY 3: THURSDAY, 28 NOVEMBER 2024	
09.00 – 11.00	**GENERAL ASSEMBLY MEETING OF NASAC** ***(By Invitation Only)***	
11.00 – 13.00	**Second Side Event** **Workshop on Open Science** (AAST, NASAC, UNESCO, AOSP, ISC, Co-Data, IAP)	
13.00 – 14.00	**LUNCH BREAK**	
14.00 – 17.00	**Cultural and Touristic Activities** (Visit Djamaa el Djazaïr, Mujahid Museum, The Casbah and Jardin d'Essai-El Hamma)	
17.15 – 18.15	**AAST-NASAC: Farewell Meeting at the Sheraton Hotel**	

FIRST SIDE EVENT:
THE LEARNING COLLABORATIVE

Venue: The International Conference Center (CIC) in Algiers, Algeria
Date and Time: 25 November 2024 | 14.00hrs – 17.00hrs
Host: Algerian Academy of Science and Technology (AAST)

MAINTAINING FINANCIAL SUSTAINABILITY WITH INDEPENDENCE

Empowering Academies of Science and Universities as Catalysts for Development

Organisers: The event is organised by NASAC, OBREAL Global, United Nations Technology Bank for the Least Developed Countries (UNTB), InterAcademy Partnership (IAP), and the Algerian Academy of Science and Technology (AAST), with the support of the African Union Commission, the Association of African Universities, and the Pan African University.

Background: The urgency to advance towards the UN Agenda 2030 and AU 2063 goals necessitate a concerted effort to bolster capacities in science, technology, and innovation (STI) across Least Developed Countries (LDCs), home to nearly one billion individuals. This imperative stems from the need to eradicate widespread poverty, unleash economic growth and achieve sustainable development. At the heart of this endeavor lies the pivotal role of academies of science, esteemed components of the international science advisory ecosystem. These merit-based institutions furnish governments with authoritative, independent counsel on matters pertaining to science, technology, and innovation. With their membership comprising top-tier talent spanning diverse technical domains, science academies wield considerable influence in shaping national STI policies and fostering sustainable development. Serving as vital conduits between government and civil society, academies of sciences offer credible guidance on scientific and technological issues, thereby contributing significantly to economic progress and societal well-being, paving the way to the achievement of the Sustainable Development Goals. This institutional capacity is further enhanced for the region when academies operate as a collective under the umbrella of the *Network of African Science Academies* (NASAC). NASAC is also the affiliate network for *InterAcademy Partnership* (IAP) in Africa.

Recent initiatives led by NASAC, IAP, and the *UN Technology Bank for LDCs* highlight the commitment to strengthening STI capacities across Africa. Despite these efforts, challenges remain in achieving institutional and operational proficiency among science academies. These challenges are also prevalent among African universities, where *OBREAL Global* has been working to foster collaboration across multiple countries. Many countries still face infrastructure shortcomings, which must be addressed to enable full development.

In response to these challenges, the aforementioned organisations have joined forces to launch a collaborative initiative aimed at enhancing the capacity of science academies and universities to actively contribute to Africa's development agenda. This initiative will kick off with the ***Learning Collaborative*** as a side event at AMASA 2024 in Algiers, which will serve as the foundation for drafting a long-term collaborative funding proposal for potential funders. The event will also strengthen both established and newly created academies of science in LDCs, leveraging the expertise and resources of the partnering organisations. The participation of African universities is critical, as the broader goal of this collaboration is to enhance Africa's STI ecosystem, which is aligned with the objective of universities as research institutions.

Rationale: This side event, titled **"MAINTAINING FINANCIAL SUSTAINABILITY WITH INDEPENDENCE: Empowering Academies of Science and Universities as Catalysts for Development,"** aligns with the AMASA 2024 theme, *"Resources, Science and Technology for Development in Africa."* The Learning Collaborative aims to address the pressing issue of financial resilience in African science academies and universities by exploring practical strategies and solutions. Academies of science and universities are envisioned to play a pivotal role in policy advising, underpinned by extensive and relevant publications. This can be achieved through the organisation of forums, workshops, conferences, and consensus studies in which policymakers and the media participate. These efforts become even more impactful when the value of academies and universities is recognised locally, enhancing their contribution to national and regional policy development. Additionally, partnerships at the national level, along with convenings focused on specific scientific areas, serve to further highlight the critical role of science academies and universities in supporting African governments in the long-term. Moreover, the side event aligns closely with AMASA's objective of empowering academies of science to assume a more prominent role as agents of development cooperation both at the national and the international levels. Equipping African Academies with the necessary skills and knowledge to navigate financial complexities, as well as building their capacity in the science-advice arena, including by learning from the experiences of other academies not only promotes institutional autonomy but also enhance their effectiveness in driving sustainable development initiatives in ways aligned to their needs.

Importantly, the discussions fostered by this event are intended to catalyse collaboration among diverse stakeholders – including policymakers, academia, funding agencies and development partners – to forge synergies that amplify the impact of scientific research and technological innovation on African development landscapes.

Objective: The overarching objective of this initiative is to harness the potential of academies and universities as catalysts for development, with a focus on financial empowerment and fostering collaborative efforts that enhance their roles as agents of development cooperation. By equipping these institutions with the requisite skills and knowledge, the event aims to enable them to access substantial funding resources effectively. This will mitigate challenges such as the misallocation of priorities, financial instability, and limited operational independence, allowing them to take a more prominent role in Africa's development.

Expected Outputs	Expected Outcomes
I. Identification of practical strategies and good practices for achieving financial sustainability.	Understanding of the financial challenges facing universities & academies of science in Africa and exploration of targeted & effective solutions to address them.
II. A comprehensive summary of the proceed ings, detailing key discussions, takeaways, and recommendations for future actions, both individually by participants & collaboratively between partners.	Increased awareness of how academies & universities can work together to garner support from policymakers and local stakeholders for the delivery of initiatives that promote sustainable development.
III. An initial draft of a collaborative funding proposal aimed at securing long-term resources for enhancing the capacity of African academies and universities, which can be presented to potential funders.	Establishment of collaborative initiatives aimed at enhancing institutional resilience and promoting local empowerment through networking & partnerships among science academies & universities in Africa.
IV. A commitment from participating organisations & stakeholders to engage in follow-up workshops, joint projects, or partnerships that address the challenges identified during the event.	Launch of a long-term collaborative funding proposal aimed at securing resources for continued capacity building and collaboration between academies and universities in Africa.

Format: The side-event will be structured to facilitate interactive discussions and knowledge sharing among participants. The event will be a 180-minute discussion featuring presentations, a panel discussion followed by questions and answers from the audience. There will also be working group discussions to provide good practices from the participants. The format of the Q&A session will feature responses to questions during the session. The event will also feature panelists with diverse backgrounds in funding STI in Africa. At the end of the session, a report will be developed to highlight the key points of discussion for follow-up and the way forward.

AGENDA

Moderator: Dr. Jackie Kado, Executive Director, NASAC

Time	Activity
14.00	**Opening remarks from NASAC and AAST** • ***Prof. Mahouton Norbert Hounkonnou,*** President, NASAC • ***Prof. Mohamed Hichem Kara,*** President, AAST
14.10	**Keynote Address (30 minutes)** *Why should academies and universities pursue financial sustainability with independence?* • ***Prof. Ramon Torrent,*** Executive President, OBREAL Global • ***Ms. Federica Irene Falomi,*** Economic Affairs Officer, UN Technology Bank for the Least Developed countries • ***Prof. Masresha Fetene,*** Co-Chair, InterAcademy Partnership
14.40	**Panel Discussion and Q&A Session (60 minutes)** • ***Prof. Olusola Bandele Oyewole,*** the *Secretary General of the AAU, and Chair of the African Chapter of OBREAL* will provide a review of the role of universities & academies of science as agents of. development • ***Dr. Oladoyin Odubanjo, Pioneer Chairman of INGSA Africa,*** will discuss the role of science advise in identifying and understanding the African developmental agenda and its relevance to the local. community

	He will also highlight the importance of collaboration and engagement with various actors to secure sustainable funding for local action. • ***Ms. Asli Hekimoglu,*** Associate Programme Officer from UNTBLDC, will provide an overview of the critical challenges faced by the LDCs in which universities and academies of sciences have a decisive influence. She will emphasise the importance of partnerships and alliances of the universities & academies of sciences in LDCs with their counterparts in neighbouring countries to find sustainable solutions. • ***Mr. Moses Ogutu,*** *Associate Program Officer of IAP,* will provide an overview of recommended strategies that provide institutional stability and sustainability that have been taken by academies of science around the world. • ***Dr. Florence Wambugu,*** *CEO of Africa Harvest Biotech Foundation International (Africa HarvestI,* will provide insights to fundraising from the private sector through consultancy work. She will also highlight the partnership with NASAC on the gene editing technology initiative with funding from the private sector.
15.40	**Group Discussions (45 minutes of group discussions and 15 minutes of presentations in plenary with 5 minutes to constitute the groups)** • Participants are divided into three working groups • Groups discuss the results of their work, identify common cases, and collaborate to develop outlines of project proposals. • Each group designates a rapporteur to summarise its discussions and proposals, who will present the proposals to all participants • Discussion to get feedback on the proposals of each working group. • At least one proposal from working groups will be selected for further development.
16.45	**Closing Remarks and Way Forward (15 minutes)** • Main take-outs and way-forward from the organisers as closing remarks • Vote of Thanks by moderator.
17.00	**End of session**

SECOND SIDE EVENT: Workshop on Open Science

Venue: The Sheraton Club des Pins Resort – Hôtel in Algiers, Algeria
Date and Time: 25 November 2024 | 14.00hrs – 17.00hrs
Host: Algerian Academy of Science and Technology (AAST)

HARNESSING OPEN SCIENCE FOR ONE HEALTH AND NATURAL HAZARDS RESILIENCE IN AFRICA

Strengthening Academies of Science and Universities as Leaders in Open Science

Organisers: The event is organised by the Algerian Academy of Sciences and Technologies (AAST), African Open Science Platform (AOSP), CODATA and the Network of African Science Academies (NASAC), the African Open Science Platform (AOSP) and Periperi U.

1. Background

Open science is a global movement that promotes the accessibility of scientific research, data, and dissemination to all, including professional researchers, citizen scientists, and the public. By fostering openness at all stages – from study design to data sharing and publication – it enhances collaboration, transparency, and knowledge-sharing across disciplines and regions. Open science accelerates innovation, improves the reliability of findings, and ensures that research benefits are accessible to the broader society, including policymakers and vulnerable communities.

In Africa, open science offers transformative potential to address complex, interrelated challenges such as public health risks, environmental degradation, natural hazards, and disaster management. The One Health approach–linking human, animal, and environmental health – is critical for sustainable development in the region. Likewise, pooling scientific expertise and technological resources across countries strengthens Africa's capacity to respond to public health threats, natural disasters, and environmental changes. This workshop will explore how mathematical modeling, biotechnological tools, and open data practices can enhance disaster risk reduction (DRR), public health interventions, and environmental management through the lens of open science.

2. Objectives of the Session

This session aims to discuss the challenges and opportunities for addressing **One Health and Natural Hazards Resilience in Africa** by leveraging open science. It will focus on how data-driven approaches can enhance forecasting, planning, and response efforts in the region. The session will also examine adaptation techniques that are best suited for Africa and explore policy frameworks needed to implement both mitigation and adaptation strategies. Through the active engagement of experts, researchers, and policymakers, the session will address key questions related to Open Science for One Health and Natural Hazards Resilience in Africa.

3. Key Issues to be Discussed

- **Advancing North-South Collaboration for one health Research:** A critical question is how to strengthen North-South collaboration to foster multi- and trans-disciplinary

research in one health. This includes identifying mechanisms for sharing knowledge and expertise between regions, developing joint research initiatives, and addressing gaps in capacity building.

- **Strengthening Open Science and Sustainable Development Research:** Open science, which promotes the sharing of research data and results, is essential for accelerating sustainable development goals. The session will explore how open science can be leveraged to strengthen research and decision-making in Africa, ensuring that data is widely accessible and effectively used in planning strategies.
- **Enhancing Disaster Risk Reduction through Data Accuracy in the framework of open science:** Open science fosters transparent data-sharing across sectors, ensuring that disaster forecasts, risk assessments, and early warning systems are based on reliable, up-to-date information. Accurate data allows for better-targeted interventions, efficient resource allocation, and community-informed decision-making. By promoting collaborative research and open access to data, stakeholders can improve preparedness and response strategies. Investing in data infrastructure and cross-border partnerships will further strengthen Africa's ability to anticipate and mitigate disaster risks effectively.
- **Identifying Barriers and Enablers for prevention Measures:** Implementing a One Health strategy in Africa within the framework of open science requires addressing several barriers and leveraging key enablers. Barriers include limited digital infrastructure, data privacy concerns, restrictive intellectual property policies, and lack of awareness about open science practices. Enablers such as accessible data platforms, cross-sectoral collaboration, capacity building, and government support can foster openness and transparency. Open science promotes real-time data sharing and co-creation of knowledge, enhancing early warning systems and preventive measures for health, environmental, and agricultural risks. Strengthening regional cooperation and investing in open access technologies will be crucial for overcoming challenges and advancing sustainable One Health solutions.

4. Expected Outcomes

I. Strengthening North-South Collaboration for One Health Research
- Development of multi- and trans-disciplinary research initiatives addressing health, environmental & agricultural challenges.
- Improved mechanisms for sharing expertise and resources between Northern and African institutions.
- Enhanced capacity building through joint programmes, research exchanges, and collaborative frameworks.

II. Leveraging Open Science for Sustainable Development
- Promotion of open access to research data to support SDGs and climate adaptation strategies in Africa.
- Strengthened decision-making processes through transparent data-sharing platforms and collaborative research.
- Better alignment of research outputs with regional and national sustainable development priorites

III. Enhancing Disaster Risk Reduction through Data Accuracy and Open Science
- Establishment of cross-sectoral frameworks for sharing real-time, accurate data to improve forcasts & early warning systems.
- Enhanced disaster preparedness through better-targeted interventions and efficient resource allocation.
- Strengthened cross-border partnerships and investment in data infrastructure to mitigate disaster risks effectively.

IV. Identifying Barriers and Enablers for One Health Strategies in Open Science
- Recognition of barriers such as limited digital infrastructure, data privacy issues, & intellectual property restrictions.
- Mobilisation of enablers, including cross-sector collaboration, accessible data platforms, capacity building and government support.
- Promotion of regional cooperation and open technologies to improve early warning systems and foster sustainable One Health solutions.

These outcomes will foster data-driven, collaborative approaches across sectors, enhancing Africa's resilience and capacity to address health, environmental, and disaster-related challenges through open science.

5. Conclusion

Addressing one health in Africa requires a coordinated effort that combines scientific research, policy innovation, and international cooperation. By leveraging open science and fostering collaboration across regions, it is possible to enhance the resilience of African countries to climate change impacts. This session will provide a platform for exchanging ideas, sharing best practices, and developing actionable solutions that can be applied across the region.

AGENDA

Time	Activity
11.00	**Welcome and Introduction (5 minutes)** • ***Dr. Tshiamo Motshegwa,*** Director, (AOSP)
11.05	**Opening Remarks from the host (5 minutes)** • ***Prof. Mohamed Hichem Kara,*** President, AAST
11.10	**Keynote Addresses (30–15 minutes each)** • ***Dr. Tshiamo Motshegwa,*** Director, African Open Science Platform (AOSP) • ***Dr. Francis P. Crawley,*** **Chairman, CODATA International Data Policy Committee (IDPC)**
11.40	**Panel Discussion and Q&A Session (65 minutes–10 minutes each followed by 15 minutes of interactive discussion facilitated by the moderator** • ***Dr. Tshiamo Motshegwa,*** Director, AOSP • ***Prof. Djillali Benouar,*** Chair of Section, AAST • ***Prof. Rania Elsayed,*** North Africa Open Science Node • ***Dr. Francis P. Crawley,*** Chairman, CODATA International Data Policy Committee (IDPC) • ***Karim Kadi,*** Head of the National UNESCO Commission (Ministry of National education)
12.45	**Closing remarks and way forward (15 minutes)** • Key Takeaways and Next Steps from the Organisers **(3 minutes each)** • The moderator will wrap up the discussions by expressing gratitude to the participants and speakers before officially closing the event **(3 minutes)**
13.00	**End of session**

90-MINUTE SESSION:
LAUNCH OF THE DECARBONISATION OF TRANSPORT REPORT

Venue: CIC, Algiers, Algeria
Date and Time: 26 November 2024 | 15.30–17.00 CET
Duration: 90 minutes

DECARBONISATION OF TRANSPORT IN AFRICA

Resilience, Technology, Innovation and Policy

Context: Transport is crucial for Africa's ecological and socioeconomic development. However, increasing reliance on fossil fuels, increased rate of motorization and rapid urbanisation significantly contribute to greenhouse gas emissions, making decarbonisation of the transport sector essential. With a projected population of 2.5 billion by 2050 in the continent, the demand for transportation offers an opportunity to implement sustainable practices. Decarbonising the transportation sector through integrating renewable energy, leveraging technology, and establishing strong policies can accelerate sustainable transition progress.

It is against this backdrop that NASAC will host a 90-minute session at the 2024 Annual Meeting of African Science Academies (AMASA 2024) in Algiers, Algeria. The theme of the session is **"Decarbonisation of Transport in Africa: Resilience, Technology, Innovation, and Policy",** based on the report published jointly by NASAC and InterAcademy Partnership (IAP) titled *'Decarbonisation of Transport in Africa: Opportunities, Challenges and Policy Options.'* The report will then be launched and disseminated in-person during the session. A virtual launch of the report was already successfully made on 29 May 2024.

During this session experts and stakeholders will share successful case studies, explore emerging technologies, and analyse effective policy frameworks. The discussion will facilitate an understanding of innovative technologies and best practices for sustainable transport solutions. Additionally, the session will also aim to share knowledge of effective policy frameworks and regulatory approaches that support sustainable transport in Africa. By leveraging findings and recommendations from the report, advance sustainable transport solutions tailored to Africa's diverse contexts will be explored.

Format: The 90-minute session will include an introduction to the key highlights from the report, followed by a panel discussion, then conclude with an interactive question-and-answer session to engage the audience. The panelists will be experts that were members of the report's Working Group.

AGENDA

Moderator: Dr. Evans Avedi, NASAC

Time	Activity
15.30	Welcome remarks by the President of NASAC – ***Prof. Norbert Hounkonnou (Benin)***
15.35	Welcome remarks by the Co-Chair of IAP – ***Prof. Masresha Fetene (Ethiopia)***
15.40	Overview of the Decarbonisation of Transport in Africa Report – ***Mr. Moses Ogutu, IAP (USA)***
15.45	Panel discussion by Working Group Members: • Prof. Abdella Kouzou (Algeria) • Dr. Mafini Dosso (Cote d'Ivoire) • Dr. Samuel Bwalya (Zambia)
16.15	**Plenary discussion**
16.45	Vote of thanks – ***Dr. Jackie Kado, NASAC (Kenya)***
16.50	Launch of the report and photo session
17.00	**End of session**

APPENDIX III:
LIST OF PARTICIPANTS

ALGERIA

1. **Prof. Mohamed Hichem Kara**
   President – Algerian Academy of Science and Technology (AAST)
   Chair – AMASA 2024 Local Organising Committee (LOC)
   Co-Chair – AMASA 2024
2. **Prof. Benouar Prof. Djillali**
   AMASA 2024 Local Organising Committee (LOC)
   Head of the section – Environment, Sustainable Development and Major Risks
   Algerian Academy of Science and Technology (AAST)
3. **Dr. Khodja Mohamed**
   AMASA 2024 Local Organising Committee (LOC)
   Algerian Academy of Science and Technology (AAST)
   Research Director – Sonatrach
4. **Prof. Mustapha Meghraoui**
   AMASA 2024 Local Organising Committee (LOC)
   Founding member and ***President*** of section in Earth Science and Universe
   Algerian Academy of Science and Technology (AAST)
5. **Dr. Zoubir Harrat**
   AMASA 2024 Local Organising Committee (LOC)
   Algerian Academy of Science and Technology (AAST)
6. **Prof. Sif-Eddine Amara**
   AMASA 2024 Local Organising Committee (LOC)
   Algerian Academy of Science and Technology (AAST)
7. **Prof. Fatima Laraba-Djebari**
   AMASA 2024 Local Organising Committee (LOC)
   Algerian Academy of Science and Technology (AAST)
8. **Prof. Khedidja Allia**
   President – AMASA 2024 Scientific Committee (SC)
   Algerian Academy of Science and Technology (AAST)/ University of Science and Technology Houari Boumediene (USTHB)
9. **Prof. SAMIA Benabbas Kaghouche**
   Chair of the Architecture, Town Planning and Regional Development Section
   Algerian Academy of Science and Technology (AAST)
10. **Prof. Benali-Cherif Noureddine**
    Algerian Academy of Science and Technology (AAST)
11. **Prof. Lounis Azzedine**
    Algerian Academy of Science and Technology (AAST)
12. **Prof. Abderrahmane Tadjeddine**
    Algerian Academy of Science and Technology (AAST)
13. **Prof. Abdellah Kouzou**
    NASAC/IAP Decarbonisation of Transport in Africa project Working Group Chair/ Djelfa University
14. **Prof. Fadila Boulahbal**
    Algerian Academy of Science and Technology (AAST)
15. **Mr. Latreche-Bouteldja Rabeh**
    Algerian Academy of Science and Technology (AAST)
16. **Prof. Touaoula Tarik**
    Algerian Academy of Science and Technology (AAST)
17. **Mr. Abdelghani Baouche**
    AMASA 2024 Organising Committee
    Algerian Academy of Science and Technology (AAST)
18. **Prof. Tilmatine Amar**
    Algerian Academy of Science and Technology (AAST)
19. **Prof. Mohamed AMARA**
    Algerian Academy of Science and Technology (AAST)
20. **Prof. Fadila Benayache**
    Founding Member – Algerian Academy of Science and Technology (AAST)
21. **Prof. El Madjid Berkouk**
    Founding Member – Algerian Academy of Science and Technology (AAST)
    Ecole Nationale Polytechnique d'Alger (ENP)
22. **Prof. Malika Bouchenak Khelladi**
    President of the Biotechnology Section
    Algerian Academy of Science and Technology (AAST)
23. **Dr. Mohamed El Messaoud Derder**
    Algerian Academy of Science and Technology (AAST)
24. **Prof. Mahmoud Boufaida**
    Founding Member – Algerian Academy of Science and Technology (AAST)
25. **Prof. Bachir Bouhafs**
    President of Physics section
    Algerian Academy of Science and Technology (AAST)
26. **Mr. Mohamed Rachid Cheriti**
    Algerian Academy of Science and Technology (AAST)
27. **Prof. Ahmed Djebbar**
    Founding Member – Algerian Academy of Science and Technology (AAST)
28. **Dr. Fatiha Hamitri-Guerfi**
    Algerian Academy of Science and Technology (AAST)/ Universite of Bejaia

29. **Prof. Ali Meftah**
President of the Energy and Technologies of industries section
Algerian Academy of Science and Technology (AAST)

30. **Prof. Abdelkader Noureddine**
Algerian Academy of Science and Technology (AAST)

31. **Prof. Khadidja Ouzeagane**
Algerian Academy of Science and Technology (AAST)

32. **Prof. Mohammed Tarik Touaoula**
Algerian Academy of Science and Technology (AAST)

33. **Prof. Habiba Zerkaoui Drias**
Algerian Academy of Science and Technology (AAST)

34. **Prof. Boumediene Abdellaoui**
Algerian Academy of Science and Technology (AAST)

BELGIUM

35. **Dr. Francis P. Crawley**
Chairman – CODATA International Data Policy Committee (IDPC)
Leuven

BENIN

36. **Prof. Mahouton Norbert Hounkonnou**
President – Network of African Science Academies (NASAC)
Co-Chair – AMASA 2024
National Academy of Sciences, Arts and Letters of Benin (ANSALB)
Cotonou

37. **Prof. Nazaire Padonou**
President – National Academy of Sciences, Arts and Letters of Benin (ANSALB)
Cotonou

BOTSWANA

38. **Prof. Ishmael Masesane**
President – Botswana Academy of Science (BAS)
Gaborone

BURKINA FASO

39. **Dr. Paco Sereme**
AMASA 2024 Scientific Committee (SC)
President – The National Academy of Sciences, Arts and Letters of Burkina Faso (ANSAL-BF)
Ouagadougou

40. **Prof. Arouna Ouedraogo**
Vice-President – The National Academy of Sciences, Arts and Letters of Burkina Faso (ANSAL-BF)
Ouagadougou

BURUNDI

41. **Prof. Juma Shabani**
President – Burundi Academy of Sciences and Technology (BAST)
Bujumbura

42. **Dr. David Niyukuri**
Chair – Burundi Council of Young Scientists
Bujumbura

CAMEROON

43. **Prof. Sammy Beban Chumbow**
AMASA 2024 Scientific Committee (SC)
President – Cameroon Academy of Sciences
Yaoundé

44. **Mr. Justine Germo Nzweundji-Khumbah**
President – Cameroon Academy of Young Scientists/ Institute of Medical Research & Medicinal Plants Studies
Yaoundé

45. **Prof. Hugues Clotaire Nana Djeunga**
Cameroon Academy of Young Scientists
Yaoundé

COTE D'IVOIRE

46. **Dr. Mafini Dosso**
NASAC/IAP Decarbonisation of Transport in Africa Project Working Group
Abidjan

47. **Prof. Yao Thomas N'Guessan**
Academy of Sciences, Arts, Cultures of Africa and African Diasporas (ASCAD)
Abidjan

48. **Prof. Bi Crépin Pene**
Director of Research – Academy of Sciences, Arts, Cultures of Africa and African Diasporas (ASCAD)
Abidjan

DEMOCRATIC REPUBLIC OF CONGO (DRC)

49. **Prof. Kalulu Taba**
Executive Secretary – Congolese Academy of Sciences (ACCOS)
Kinshasa

50. **Prof. Léon Tshilolo**
Congolese Academy of Sciences (ACCOS)/Institut de Recherche Biomédicale
Kinshasa

EGYPT

51. **Dr. Menna El-Kotamy**
International Cooperation Coordinator –Academy of Scientific Research and Technology (ASRT)
Cairo

52. **Prof. Rania Elsayed Ibrahim**
National Authority for Remote Sensing & Space Sciences
Cairo

53. **Prof. Abdelfattah Badr**
NASAC – Africa Harvest Gene Editing Technology Initiative (GETI) Champion
Professor of Genetics and Plant Biodiversity –Helwan University
Cairo

54. **Prof. Naglaa Abdallah**
NASAC – Africa Harvest Gene Editing Technology Initiative (GETI) Champion
Department of Genetics, Cairo University
Cairo

ETHIOPIA

55. **Prof. Masresha Fetene Workneh**
Co-President – IAP
Addis Ababa

56. **Prof. Yohannes Teketel**
Executive Director – Ethiopia Academy of Science (EAS)
Addis Ababa

FRANCE

57. **Dr. Vanessa McBride**
Science Director – International Science Council (ISC)
Paris

GERMANY

58. **Dr. Erik Hansalek**
Federal Ministry of Education and Research (BMBF)
Berlin

59. **Dr. Doreen Strauhs**
Federal Ministry of Education and Research (BMBF)
Berlin

GHANA

60. **Prof. Benjamin Ahunu**
Ghana Academy of Arts and Sciences (GAAS)
Accra

61. **Prof. Olusola Bandele Oyewole**
Secretary General – Association of African Universities (AAU)
Chair – OBREAL African Chapter
AAU-OBREAL
Accra

62. **Dr. Nkansah Marian Asantewah**
Ghana Academy of Arts and Sciences (GAAS)
Kwame Nkrumah University Of Science And Technology (KNUST)
Kumasi

KENYA

63. **Dr. Jackie Kado**
Executive Director – Network of African Science Academies (NASAC)
AMASA 2024 Organising Committee
Nairobi

64. **Dr. Evans Avedi**
Partnerships & Outreach Manager – Network of African Science Academies (NASAC)
Nairobi

65. **Mrs. Elizabeth Andrew**
Finance and Administration Manager – Network of African Science Academies (NASAC)
Nairobi

66. **Mr. Jack Omondi**
Programme Manager – Network of African Science Academies (NASAC)
Nairobi

67. **Ms. Fatuma Achieng**
Programme Officer – Network of African Science Academies (NASAC)
Nairobi

68. **Mr. Benard Magudha**
Media & IT Assistant – Network of African Science Academies (NASAC)
Nairobi

69. **Prof. Ratemo Michieka**
President – Kenya National Academy of Sciences (KNAS)
Nairobi

70. **Prof. Vasey Mwaja**
AMASA 2024 Scientific Committee (SC)
Editor-in-Chief – Kenya National Academy of Sciences (KNAS)
Nairobi

71. **Prof. Robinson Musembi**
Assistant Treasurer – Kenya National Academy of Science (KNAS)/ University of Nairobi
Nairobi

72. **Prof. Florence Wambugu**
Chief Executive Officer – Africa Harvest Biotechnology Foundation International
Nairobi

73. **Mr. Antony Aseta**
Manager – Africa Harvest Biotechnology Foundation International
Nairobi

KINGDOM OF ESWATINI

74. **Dr. Thabile Ndlovu**
Secretary – Kingdom of Eswatini Academy of Sciences (KEAS)
Lobamba

LESOTHO

75. **Dr. Makhamisa Senekane**
Secretary General – Lesotho Academy of Science and Technology (LAST)
Maseru

MADAGASCAR

76. **Prof. Irene Rabenoro**
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South African Young Academy of Science (SAYAS)
Johannesburg

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Tunisian Academy of Science and Arts (Beit al-Hikma)/University Tunis El Manar
Tunis

TURKEY

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Economic Affairs – United Nations Technology Bank (UNTB)
Istanbul

98. **Mrs. Asli Hekimoglu**
Associate Programme Management Officer – United Nations Technology Bank (UNTB)
Istanbul

UGANDA

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Uganda National Young Academy/Makerere University
Kampala

UNITED STATES OF AMERICA (USA)

100. **Mr. Moses Ogutu**
NASAC/IAP Decarbonisation of Transport in Africa project
Associate Program Officer – InterAcademy Partnership (IAP)
Washington

ZAMBIA

101. **Prof. Godfrey Biemba**
President – Zambia Academy of Sciences (ZaAS)
Lusaka

102. **Dr. Samuel Bwalya**
NASAC/IAP Decarbonisation of Transport in Africa project Working Group
Lusaka

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For more information, please contact:

The NASAC Secretariat

Zamani Business Park
Tree Lane Off Ngong Road,
Kar en, Nairobi, Kenya
Tel: +254 712 914285 | +254 739 000770
Email: info@nasaconline.org
Website: nasaconline.org

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