African Women Scientists Driving Science Diplomacy in Times of Crisis

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CONTENTS

FOREWORD 8

PROFILES OF WORKING GROUP MEMBERS 10

PARTNERS AND EXTERNAL CONTRIBUTORS 12

ABOUT NASAC 13

ABOUT INGSA AFRICA 14

ABOUT EASAC 15

ABOUT IAP 16

EXECUTIVE SUMMARY 17

COMMONLY USED ABBREVIATIONS 21

1. INTRODUCTION 22

1.1 Background and Context 22

1.2 The Gender Imperative: Advancing Equity in Science Diplomacy 24

1.3 Barriers and Opportunities for African Women in Global Science Diplomacy 25

1.3.1 Key Barriers to Women's Full Engagement in Science Diplomacy 25

1.3.2 Emerging Opportunities for Greater Participation 26

1.4 Purpose and Scope 27

1.5 Conclusion 28

2. SCIENCE DIPLOMACY AND AFRICA'S GRAND CHALLENGES: A GENDERED LENS 29

2.1 Introduction 29

2.2 Transforming the Water–Energy–Food (WEF) Nexus 30

2.3 Strengthening Health Systems and Pandemic Response 31

2.4 Addressing Climate Change and Sustainable Development ... 32

2.4.1 Integrating Gender into Sustainable Development Strategies ... 34

2.4.2 Science Diplomacy as an Enabler for Gender-Responsive Climate Action ... 35

2.5 Confronting Security Threats: Women in Chemical, Biological, Radiological, and Nuclear (CBRN) Diplomacy ... 37

2.5.1 Role of Women in CBRN Diplomacy ... 38

2.5.2 Case Study: Dr. Janes Mokgadi – Leading Botswana's CBRN Strategy ... 40

2.6 Advancing Peacebuilding and Post-Conflict Recovery ... 41

2.6.1 Gendered Realities of Conflict and Research ... 42

2.6.2 Science Diplomacy as a Pathway to Protection and Peace ... 43

2.6.3 Scientific Institutions as Diplomatic Agents ... 43

2.7 Shaping the Science–Policy Interface: Women's leadership at negotiation tables ... 44

2.7.1 Context: The Visibility of Women in Science–Policy and Peace Diplomacy ... 45

2.7.2 Profile and Scholarship: Professor Benigna Zimba and the Study of the Global Slave Diaspora ... 45

2.7.3 Contributions to Higher Education and Institutional Leadership ... 46

2.7.4 Reflection: Women as Architects of Inclusive Governance ... 47

2.8 War on Gender and Education in Sudan: A Call for Gender-Sensitive Recovery ... 47

2.8.1 Deepening Gender Inequalities and Emerging Resilience ... 48

2.8.2 Towards a Gender-Sensitive Recovery and Future ... 48

2.8.3 Science in the Shadow of War: The Story of Dr. Hala Taha Elbashir ... 49

2.8 Conclusion ... 50

3. AFRICAN INSTITUTIONS DRIVING INCLUSIVE SCIENCE DIPLOMACY 51

3.3 Introduction 51

3.3 Institutional Landscape 52

3.2.1 IAP: A Global Platform for Science Diplomacy 52

3.2.2 NASAC: A Regional Hub for Science Diplomacy 53

3.2.3 EASAC's Commitment to Gender Equality 53

3.2.4 OWSD: Empowering Women in Science 54

3.2.5 INGSA-Africa: Building Capacity for Evidence-Informed Policy 54

3.2.6 Continental and Regional Mechanisms for Advancing STI and Gender-Inclusive Diplomacy 55

3.3 Institutional Programmes and Fellowships Advancing Inclusive Science Diplomacy 55

3.3.1 The UNESCO Chair for Water, Women and Decision-Making Power 56

3.3.2 OWSD Fellowships: Building Scientific Leadership 56

3.3.3 Women in Science Without Borders (WISWB) 57

3.3.4 INGSA-Africa Policy Labs and Training 57

3.3.5 Case Studies of Institutional Impact 57

3.3.6 Lessons Learned from the Programmes and Fellowships 58

3.4 Policies and Frameworks 58

3.4.1 Continental Policy Frameworks 58

3.4.2 National Gender and STI Policies 58

3.4.3 Regional and International Alignment 59

3.4.4 Pathways to Reform 59

3.5 Facilitating Cooperation 60

3.5.1 Barriers to Inclusive Cooperation 60

3.5.2 Emerging Models of Cooperation 60

3.5.3 Implications for Science Diplomacy 61

3.6 Conclusion 61

4. VOICES AND CONTRIBUTIONS OF AFRICAN WOMEN SCIENTISTS 62

4.1 Introduction 62

4.2 Amplifying the Voices and Contributions of Women Scientists in Africa and Science Policy 63

4.2.1 ***Dr. Matshidiso Moeti's*** *Transformational Role in Responding to HIV and H1N1 (Botswana)* 63

4.2.2 ***Dr. Segenet Kelemu's*** *Leadership in Sustainable Agriculture and Climate Resilience (Ethiopia)* 67

4.2.3 ***H.E. Ellen Johnson Sirleaf*** *Impactful Peacebuilding Through Women's Leadership (Liberia)* 69

4.3 Leadership Spotlights 70

4.3.1 ***Prof. Rose Gana Fomban Leke*** *– Professor of Immunology (Cameroon)* 71

4.3.2 ***Prof. Wangari Maathai*** *– Nobel Laureate (Kenya)* 71

4.3.3 ***Dr. Balgis Osman-Elasha*** *– Climate Scientist and IPCC Contributor (Sudan)* 72

4.3.4 ***Prof. Lindiwe Majele Sibanda*** *– Chair, CGIAR Integrated Partnership Board (South Africa)* 73

4.3.5 ***Dr. Asha Dookun-Saumtally*** *– Plant Biotechnologist (Mauritius)* 73

4.3.6 ***Prof. Rajaâ Cherkaoui El Moursli*** *– Bridging Nuclear Science and Public Health (Morocco)* 74

4.4 Crisis Response: Women Scientists in Conflict-Affected Eastern Democratic Republic of Congo 75

4.4.1 Women Scientists in Peacebuilding and Reconstruction 75

4.4.2 Health Crises and War: Women Scientists on the Frontlines 76

4.4.3 Resource and Environmental Challenges 76

4.4.4 Innovations in Climate Adaptation and Community Resilience 77

4.4.5 Barriers and Opportunities 77

4.4.6 Lessons for Science Diplomacy in Africa 78

4.5 Conclusion 78

5. POLICY PATHWAYS FOR INCLUSIVE SCIENCE DIPLOMACY 80

5.1 Introduction 80

5.2 Policy Pathway 1: Representation and Visibility 80

5.3 Policy Pathway 2: Networks and Mentorship 81

5.4 Policy Pathway 3: Capacity Development 83

5.5 Policy Pathway 4: Institutional and Policy Integration 84

5.6 Policy Pathway 5: Recognition and Reward Systems 85

5.7 Conclusion 85

6. CONCLUSION – A CALL TO ACTION 86

6.1 Towards an Inclusive Future for Science Diplomacy in Africa 86

6.2 Key Reflections from the Study 87

6.3 A Framework for Action 88

6.4 The Moral Imperative 88

6.5 A Call to Collective Leadership 89

6.6 Closing Vision: From Inclusion to Influence 90

REFERENCES 91

LIST OF TABLES

TABLE 1. HIV Progress in the WHO African Region (2015–2024) 65

LIST OF FIGURES

FIGURE 1. Growth in ART Coverage in the WHO African Region (2010–2024) 64

FIGURE 2: Mentoring connects factors such as motivation, coaching, and support 82

FOREWORD

Science diplomacy has become an indispensable instrument for addressing complex global crises that transcend national boundaries, from health crises and climate change to food security and peacebuilding. Within this dynamic landscape, African women scientists have demonstrated remarkable leadership, innovation, and resilience, often serving as bridges between knowledge, policy, and societal transformation.

This publication, *African Women Scientists Driving Science Diplomacy in Times of Crisis*, represents a significant milestone in documenting and amplifying these contributions. It brings to light the experiences and achievements of women who have navigated the intersections of science and diplomacy, and who continue to shape policy processes at national, regional, and global levels.

As the umbrella body for science academies in Africa, NASAC remains committed to advancing the role of science in policy and development, while ensuring that gender equity remains central to this vision. Through the Women for Science (WfS) Working Group, NASAC actively supports mentorship, collaboration, and capacity building to expand the participation of women in science leadership and international cooperation.

The insights captured in this report are both a reflection and a call; a reflection on how far we have come, and a call to intensify efforts toward creating inclusive spaces where women scientists can thrive as diplomats, innovators, and changemakers. The success stories highlighted herein reaffirm that Africa's progress in science diplomacy depends not only on its scientific capacity but also on the inclusivity and diversity of its human capital.

On behalf of NASAC, I extend my sincere appreciation to all contributors, including INGSA-Africa, EASAC, partners, and institutions, who made this work possible. May it serve as both an inspiration and a roadmap for the next generation of women scientists who will carry forward Africa's leadership in science diplomacy.

Ptof. Ekanem Ikpi Braide
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ABOUT NASAC

The Network of African Science Academies (NASAC) is a network of 32 merit-based national academies in Africa. NASAC's main objective is to unite science academies and facilitate discussions on the scientific aspects of challenges of common concern, make joint statements, and provide science-informed advice to policy and decision-makers in Africa. Additionally, NASAC creates awareness of the value of science academies to socio-economic development and works with scientists to establish science academies in countries where none exist. NASAC's networking capacity serves as an effective resource for communicating appropriate thematic information and coordinating efforts among different sectors and stakeholders in academia, policy, and society. Specifically, through its membership, NASAC continues to provide advice to regional bodies and organisations on science-related issues of importance to Africa's development. It has also enhanced the capacity of academies in Africa to improve their roles as independent science advisors to governments and to strengthen their national, regional, and international functions. NASAC is the affiliate network for the InterAcademy Partnership in Africa. The secretariat of NASAC is based in Nairobi, Kenya. More information is available at *www.nasaconline.org*.

ABOUT INGSA AFRICA

The International Network for Governmental Science Advice (INGSA) - Africa is a collaborative platform for policy exchange, capacity building, and research across diverse global science advisory organisations and national systems. Through workshops, conferences, and a growing catalogue of tools and guidance, the network aims to enhance the global knowledge-to-policy interface to improve the potential for evidence-informed policy formation at sub-national, national, and transnational levels. More information is available at *https://ingsa.org/chapters/africa/*.

ABOUT EASAC

European Academies Science Advisory Council (EASAC), founded in 2001 at the Royal Swedish Academy of Sciences, is a network of European national science academies, including members from EU states, Norway, Switzerland, the United Kingdom, and the pan-European Academia Europaea. Its mission is to provide policymakers at national and EU levels with independent, evidence-based analysis to support informed decision-making across areas such as environment, energy, biosciences, and public health. EASAC operates transparently, free from commercial or political influence. As Europe's regional member of the InterAcademy Partnership (IAP), it engages with global networks of science academies and collaborates closely with FEAM, ALLEA, and SAPEA within the European Commission's Scientific Advice Mechanism. Through these partnerships, EASAC strengthens scientific cooperation and ensures that European policies are grounded in robust scientific evidence. More information is available at *https://easac.eu/*.

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ABOUT IAP

The InterAcademy Partnership (IAP) is a global network of 150 academies of science, engineering, and medicine. With its four regional networks–in Africa (NASAC), the Americas (the InterAmerican Network of Academies of Sciences, IANAS), Asia/Oceania (the Association of Academies and Societies of Sciences in Asia, AASSA) and Europe (the European Academies Science Advisory Council, EASAC), IAP provides a platform for mobilising regional and national expertise on wide-ranging issues of global importance, and for facilitating cooperation with other key stakeholders and potential partners. IAP's secretariat offices are hosted by The World Academy of Sciences in Trieste, Italy, and the National Academy of Sciences in Washington, DC, USA. More information is available at *www.interacademies.org*.

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EXECUTIVE SUMMARY

The advancement of **inclusive science diplomacy** is essential to ensuring that Africa's scientific voice is both visible and influential in global decision-making. This report, titled *African Women Scientists Driving Science Diplomacy in Times of Crisis*, presents a comprehensive analysis of how African women scientists are shaping science, policy, and diplomacy across the continent and beyond, particularly in response to pressing challenges such as climate change, health emergencies, and socio-political instability. It draws on case studies, institutional profiles, and policy analyses to illuminate pathways for gender equity in science leadership and international cooperation. The report underscores that in an era of overlapping climate, health, and socioeconomic crises, the leadership of African women scientists is essential for strengthening Africa's science diplomacy capacity and shaping coordinated, evidence-based responses.

Across Africa, women scientists have emerged as champions of evidence-based policymaking, advocates for peace and sustainability, and contributors to global knowledge systems. Yet, despite notable progress, structural barriers, including underrepresentation, funding disparities, and institutional biases, continue to limit their full participation in science diplomacy. The report underscores that empowering women in science is not only a matter of equity but also a strategic imperative for Africa's sustainable development.

The findings reveal that inclusive science diplomacy in Africa is anchored in three interdependent pillars:

1. **Institutions as Enablers:** Organisations such as IAP, NASAC, EASAC, INGSA-Africa, African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD), African Union Commission Department of Education, Science, Technology and Innovation (ESTI), and Organisation for Women

in Science for the Developing World (OWSD) provide critical platforms that connect science with policy and diplomacy. These entities embed gender-responsive approaches in governance, fostering networks that amplify women's contributions and facilitate cross-border collaboration.

2. **Programmes and Fellowships as Catalysts:** Structured training, mentorship, and fellowship programmes are building the next generation of women science diplomats, bridging the gap between research and policy action. Initiatives like NASAC's Women for Science (WfS) Working Group, OWSD Fellowships, and INGSA – Africa's capacity-building efforts equip women with skills in negotiation, policy engagement, and leadership, enabling them to influence global agendas.
3. **Policies and Frameworks as Sustainers:** Continental and national frameworks, including Agenda 2063, STISA-2034, the SADC Protocol on Science, Technology, and Innovation, and the African Union's Peace and Security Council commitments, institutionalise gender equity. These ensure that inclusivity becomes integral to Africa's STI agenda, with mechanisms for gender quotas, audits, and mainstreaming in decision-making processes.

Through in-depth case studies and leadership spotlights, the report highlights exemplary women leaders who demonstrate how African women scientists are shaping the three dimensions of science diplomacy: science in diplomacy (informing policy with evidence), diplomacy for science (facilitating international collaboration), and science for diplomacy (using knowledge to build trust and partnerships).

The report also addresses Africa's grand challenges through a gendered lens, including the Water–Energy–Food (WEF) nexus, health systems strengthening, climate change adaptation, Chemical, Biological, Radiological, and Nuclear (CBRN) security threats, and peacebuilding in conflict zones like eastern Democratic Republic of Congo and Sudan. Women scientists are pivotal in these areas, integrating indigenous knowledge with scientific expertise to produce equitable, context-sensitive solutions.

Key challenges identified include unequal access to funding and infrastructure, persistent gender biases, limited mentorship networks,

and the impacts of conflict and displacement on research continuity. Opportunities for advancement lie in capacity-building programmes, digital engagement, global policy shifts toward diversity, and alignment with SDGs.

Key Messages

1. Inclusive science diplomacy is a strategic necessity for Africa. Women scientists bring unique, community-grounded perspectives that enhance policy legitimacy, innovation, and global influence.
2. Structural barriers must be dismantled through gender quotas, equitable funding, mentorship networks, and institutional reform to unlock women's full leadership potential.
3. Mentorship and capacity-building programmes are high-impact investments. Initiatives like NASAC WfS, OWSD, and INGSA-Africa are proven pathways to diplomatic readiness.
4. Policy coherence and institutionalisation are urgent. Embedding gender equity in STI frameworks, foreign policy, AU mechanisms, and national science advisory bodies is vital.
5. Recognition and visibility drive systemic change. Continental awards, directories, and observatories legitimise and amplify African women's contributions to global science diplomacy.

Call to Action

To translate these insights into concrete action, Africa must advance a coordinated, gender-responsive science diplomacy agenda built on five pillars:

1. **Policy Commitment:** embedding gender equity across STI and foreign policy frameworks;
2. **Resource Allocation:** instituting gender-responsive budgeting and dedicated funding for women-led research and leadership development;
3. **Institutional Accountability:** mandating gender audits and regular progress reporting;

4. **Education and Capacity Building:** expanding STEM pathways, postgraduate opportunities, and science diplomacy training for girls and women; and
5. **Partnership and Recognition:** fostering collaboration, spotlighting women scientists, and amplifying African excellence.

Achieving this requires not only commitment but effective coordination, and institutions such as the African Union, AUDA-NEPAD, and NASAC are well-placed to convene stakeholders and drive progress. Ultimately, inclusive science diplomacy is Africa's pathway to resilience, equity, and global influence – and empowering women in science is not an act of charity but a strategic investment in the continent's future.

COMMONLY USED ABBREVIATIONS

AUDA-NEPAD	African Union Development Agency - New Partnership for Africa's Development
CBRN	Chemical, Biological, Radiological, and Nuclear
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
COTE	Technical Commission for National and Inclusive Dialogue
EASAC	European Academies Science Advisory Council
IAP	InterAcademy Partnership
IHRN	International Human Rights Network of Academies and Scholarly Societies
INGSA	Intergovernmental Network for Government Science Advice
NASAC	Network of African Science Academies
OPCW	Organisation for the Prohibition of Chemical Weapons
OSSREA	Organisation for Social Science Research in Eastern and Southern Africa
OWSD	Organisation for Women in Science for the Developing World
PAU	Pan-African University
SDCfA	Science Diplomacy Capital for Africa
SDGs	Sustainable Development Goals
SIPRI	Stockholm International Peace Research Institute
STI	Science, Technology, and Innovation
STISA	Science, Technology and Innovation Strategy for Africa
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
UNICRI	United Nations Interregional Crime and Justice Research Institute
UNODA	United Nations Office for Disarmament Affairs
WHO	World Health Organisation
WIOMSA	Western Indian Ocean Marine Science Association

1 INTRODUCTION

1.1 Background and Context

In the 21st century, the intersection of science, technology, and international relations, commonly known as *science diplomacy*, has become essential to addressing the world's most complex and interconnected challenges. Issues such as climate change, pandemics, food insecurity, energy transitions, and other interconnected global crises transcend national borders and demand solutions grounded in both scientific evidence and diplomatic collaboration (Turekian *et al*., 2015).

To ensure that this collaboration is robust, this publication embraces a definition of science that is scope inclusive. While discourse often privileges STEM fields, our analysis asserts that African women scientists must explicitly include experts from the Social Sciences and Humanities (SSH). Disciplines such as political science, law, sociology, and history are foundational, not supplementary, because the success of any diplomatic solution, particularly in times of complex crises, ultimately hinges on understanding governance, human behaviour, policy implementation, and ethical frameworks.

Within this global landscape and deliberately inclusive framework, **African women scientists have emerged as vital actors,** driving innovation, informing policy, and serving as bridges between research communities and governance systems at national, regional, and international levels. Historically, women's contributions, especially those from the Global South, have been marginalised in scientific discourse (Lee, 2024). Yet in recent decades, African women scientists have gained visibility and influence through their expertise, leadership, and resilience, often demonstrated in responding to national and regional crises. They have advanced knowledge and policy in areas such as

climate change adaptation, health research, sustainable agriculture, and biodiversity conservation (Asiedu, 2023).

In recent years, Africa has faced a convergence of crises that have reshaped the demands on its scientific and diplomatic systems. Climate-induced disasters, emerging and re-emerging diseases, food insecurity, and sociopolitical instability continue to test the continent's resilience and its capacity for coordinated, evidence-informed decision-making. These crises highlight the critical need for inclusive science diplomacy, where diverse scientific voices, including those of African women, inform national, regional, and global responses. Although often underrepresented in leadership, African women scientists are playing key roles in health research, climate adaptation, agriculture, peacebuilding, and community resilience, making their contributions indispensable in crisis contexts.

Building on this critical role in times of crisis, despite limited access to resources, gender bias, and underrepresentation in leadership roles (Historically, out of 54 African countries, fewer than 10 have ever had a woman president or prime minister), African women scientists continue to expand the boundaries of both science and diplomacy, particularly in addressing Africa's recurring and emerging crises. Their contributions span several strategic domains:

- **Climate change mitigation and adaptation:** spearheading research in climate-resilient agriculture, water resource management, and community-based adaptation strategies that inform global policy (Martin, 2022).
- **Health research and pandemic response:** leading efforts in epidemiology, diagnostics, and public-health communication during crises such as Ebola and COVID-19 (Lal *et al*., 2020).
- **Sustainable agriculture and food security:** improving nutrition outcomes through research on resilient food systems (AfDB, 2025).
- **Renewable energy and sustainable development:** advocating equitable access to clean energy and influencing policy on sustainability (World Bank, 2022).
- **Biodiversity conservation and ecosystem management:** preserving indigenous knowledge systems and promoting community-based resource management (Mrema, 2020).

These efforts not only expand Africa's scientific influence but also shape policies that foster innovation and resilience across the continent.

1.2 The Gender Imperative: Advancing Equity in Science Diplomacy

Science diplomacy sits at the intersection of evidence, policy, and negotiation. It facilitates cooperation among countries to address global problems that transcend borders (Gluckman, 2022). For Africa, where transboundary issues such as infectious disease, desertification, and resource scarcity require coordinated action, science diplomacy is particularly vital.

African women scientists bring distinct value to this process. Their perspectives, shaped by community engagement and lived experience, enable them to link scientific research with culturally grounded policy solutions. Building on this, African women scientists are increasingly contributing to the space where scientific expertise, health protection, and international cooperation intersect. Their leadership in these domains demonstrates that women are not merely beneficiaries of global security frameworks but active architects of resilience and trust-building, especially in contexts where science diplomacy must respond to urgent and complex challenges. Thus, their involvement is not simply a question of equity; it is a strategic necessity. Inclusive decision-making yields more innovative, context-sensitive outcomes, enhancing the quality and legitimacy of policy.

Crucially, SSH women scientists are indispensable for addressing the Social, Ethical, Legal, and Cultural (SELC) dimensions of global challenges. Their expertise ensures that diplomatic responses to issues like equity in vaccine access, the protection of indigenous knowledge rights, and complex migration policy are informed by principles of justice and human-centred governance, mitigating potential unintended consequences of purely technical solutions. This holistic approach is critical for the continent, where socio-cultural context heavily influences the adoption and success of scientific innovations.

Furthermore, women scientists have been instrumental in climate-resilient agriculture, gender-responsive health strategies, and sustainable resource management (UN Women, 2021). By integrating indigenous knowledge with advanced research, they produce solutions that are both inclusive and sustainable. Their participation also strengthens mentorship and visibility for younger generations, ensuring continuity of leadership and advocacy for equitable science governance (Founou *et al*., 2023).

Yet, systemic barriers persist, including limited funding, bias, and lack of representation in senior decision-making roles (UNESCO, 2025). Overcoming these obstacles demands intentional interventions: equitable funding opportunities, structured mentorship, supportive networks, and recognition of women's leadership at institutional and diplomatic levels. Empowering African women scientists is thus a pathway not only to gender justice but also to achieving the **Sustainable Development Goals (SDGs),** particularly those on gender equality, innovation, and partnership.

The gender imperative underscores a truth: **inclusive science diplomacy leads to better science and better outcomes.** When African women scientists are fully engaged, the continent gains stronger research capacity, more effective policy responses, and a global voice grounded in both expertise and empathy.

1.3 Barriers and Opportunities for African Women in Global Science Diplomacy

While African women scientists are making significant inroads, their full participation in science diplomacy remains constrained by systemic inequities. These barriers, however, also open pathways for reform and innovation.

1.3.1 Key Barriers to Women's Full Engagement in Science Diplomacy

- **Unequal access to funding and infrastructure:** Research grants and institutional resources often flow through male-dominated networks, limiting women's ability to lead large projects or join international collaborations (UNESCO, 2025).

- **Persistent gender bias and stereotypes:** Women's expertise is frequently undervalued, and they are less likely to be appointed to senior policy or diplomatic positions (*Verdugo-Castro et al*., 2023; Chanda and Ngulube, 2024).
- **Work–life imbalance:** Societal expectations and inadequate institutional support, such as flexible work arrangements or childcare, make it difficult to sustain participation in time-intensive diplomatic roles (AUDA-NEPAD, 2022).
- **Limited mentorship and networks:** Exclusion from influential professional circles curtails collaboration, visibility, and access to information critical for policy influence (Chauhan and Mishra, 2021).

Together, these barriers create a cycle of underrepresentation and reduced influence, reinforcing the need for structural change.

1.3.2 Emerging Opportunities for Greater Participation

Despite the challenges, momentum for inclusion is growing. Key opportunities include:

- **Capacity-building and mentorship programmes:** Targeted fellowships, scholarships, and leadership initiatives can cultivate skills and confidence for both research and diplomacy (Emma, 2025).
- **Digital engagement:** Virtual platforms, online training, and international e-collaborations now allow women scientists to participate globally despite mobility or funding constraints (Ngalomba *et al*., 2024).
- **Global policy shifts toward diversity and inclusion:** Funding agencies and international organisations increasingly prioritise gender equity, creating openings for African women to shape global science agendas (The African Academy of Sciences, 2020).
- **Alignment with the SDGs:** Efforts that empower women scientists contribute directly to SDG 5 (Gender Equality) and SDG 9 (Industry, Innovation, and Infrastructure), reinforcing Africa's strategic development goals (The African Academy of Sciences, 2024).

By seizing these opportunities and dismantling systemic barriers, African institutions and partners can unlock a vast reservoir of talent and leadership.

1.4 Purpose and Scope

This publication seeks to **document, celebrate, and amplify the contributions of African women scientists in science diplomacy in times of crisis.** Through case studies, narratives, and institutional analyses, it aims to:

I. Inspire future generations of African women to pursue careers at the intersection of science and diplomacy. This is achieved by showcasing role models and case studies that demonstrate tangible pathways from scientific research to diplomatic leadership and policy influence.

II. Promote diversity, equity, and inclusion in STEM and international relations by identifying systemic barriers and proposing policy and institutional reforms that advance gender equality in science diplomacy.

III. Foster collaboration and knowledge exchange by highlighting successful regional and cross-border initiatives that connect African women scientists to global science diplomacy networks.

IV. Inform evidence-based policymaking by synthesising research and providing actionable policy pathways for integrating gender perspectives into science diplomacy frameworks.

V. Empower African women scientists as agents of innovation, sustainability, and peace by demonstrating how their contributions to climate action, health diplomacy, and conflict resolution strengthen Africa's voice in global governance.

By bringing their voices and achievements to the forefront, this work contributes to a more inclusive and effective science-diplomacy ecosystem, one where Africa's women scientists stand as architects of the continent's sustainable and equitable future.

1.5 Conclusion

By bringing their voices and achievements to the forefront, this work contributes to a more inclusive and effective science-diplomacy ecosystem, one where Africa's women scientists stand as architects of the continent's sustainable and equitable future.

This chapter underlines that expanding their visibility and leadership is not only a matter of equity but a strategic imperative for Africa's scientific and diplomatic advancement. Empowering African women scientists will unlock untapped expertise essential for shaping global science agendas, fostering regional collaboration, and ensuring that Africa's priorities are effectively represented in international negotiations.

SCIENCE DIPLOMACY AND AFRICA'S GRAND CHALLENGES: A GENDERED LENS

2

2.1 Introduction

Over the past two decades, the visibility and influence of African women scientists have grown steadily, especially in efforts to address major development challenges across the continent. This rise has not been accidental, reflecting both increased access to higher education and the expanding role of research-for-development in shaping Africa's future.

Women scientists today are central to bridging the gap between research and policy. Their lived experiences, deep community connections, and contextual awareness position them uniquely to translate scientific evidence into practical, equitable solutions. Through this dual engagement, they not only advance knowledge but also redefine the practice of science diplomacy itself, making it more inclusive, context-aware, and responsive to the realities of African societies.

This chapter explores how **science diplomacy, viewed through a gender lens,** contributes to tackling Africa's complex and interconnected challenges. It highlights six thematic areas where women scientists are making notable contributions:

- The Water–Energy–Food (WEF) nexus
- Health systems and pandemic response
- Climate change and sustainable development
- Security threats related to Chemical, Biological, Radiological, and Nuclear (CBRN) materials
- Peacebuilding and post-conflict recovery
- Women's leadership at the science–policy interface.

Together, these themes illustrate how gender-responsive science diplomacy can drive transformation across the continent.

2.2 Transforming the Water–Energy–Food (WEF) Nexus

In recent years, approaches to resource management have shifted from isolated sectoral planning toward integrated frameworks such as the Water–Energy–Food (WEF) Nexus, which recognises the interdependence of these critical systems (Al-Saidi and Elagib, 2017). Actions in one domain inevitably influence the others, making integrated governance essential to balance synergies, minimise trade-offs, and safeguard ecosystems (Gandidzanwa and Togo, 2022).

This approach is especially crucial for Africa, where population growth, expected to double to over two billion by 2050, will intensify pressures on water, food, and energy systems (You, Hug and Anthony, 2015). Millions already face scarcity in these areas (WHO, 2024). Yet, research on nexus governance in Africa remains limited (Simpson *et al*., 2023). Scholars advocate for inclusive, locally grounded research that prioritises underrepresented regions, fosters equitable collaborations, and aligns with the SDGs (Richelle, Mao and Liebe, 2025).

Science diplomacy provides a strategic mechanism to address these complexities. It brings together scientists, policymakers, and diplomats to negotiate shared resource use, harmonise cross-border policies, and manage transboundary ecosystems. Many of Africa's major rivers, such as the Nile, Congo, and Niger, share cross-national boundaries, meaning that upstream decisions have downstream consequences (Mooren *et al*., 2024). Inclusive governance of such systems demands not only technical expertise but also trust, transparency, and collaboration among states.

Here, **women scientists play a catalytic role.** Their community-centred approaches emphasise equity and participation, ensuring that solutions reflect the realities of women and marginalised groups, such as access to household water, energy for small-scale enterprises, or sustainable farming inputs. By embedding inclusivity in WEF governance, women enhance both the legitimacy and the impact of cooperative frameworks.

Science diplomacy, guided by women's leadership, also facilitates **knowledge co-production and shared learning,** transforming scientific

collaboration into a diplomatic tool for peace and sustainability. Through initiatives such as the **Belmont Forum** and **Future Earth,** African researchers are increasingly participating in transnational research programmes that promote equitable partnerships and interdisciplinary engagement (Leck *et al*., 2015). These collaborative efforts help the continent move from vulnerability, marked by scarcity and climate risks, to opportunity, characterised by innovation, cooperation, and resilience.

2.3 Strengthening Health Systems and Pandemic Response

The COVID-19 pandemic exposed the fragility of global health systems, with particularly severe consequences in low- and middle-income countries. In Africa, limited infrastructure, resource shortages, and service disruptions deepened existing inequalities, especially among vulnerable groups such as pregnant women (Aranda *et al*., 2022).

Through a gendered lens, the pandemic revealed both structural weaknesses and opportunities for reform. Women bore disproportionate burdens, not only as caregivers and health workers but also as scientists striving to fill critical research and policy gaps. For instance, pregnant women faced elevated hospitalisation risks and adverse outcomes such as preterm births (Allotey *et al*., 2020). Exclusion from early vaccine trials further delayed access to life-saving interventions (Marwa *et al*., 2024).

Science diplomacy offers a pathway to strengthen these systems by linking scientific research to inclusive policy design. It encourages collaboration between governments, research institutions, and global health organisations to co-develop adaptive, equitable responses (Dinar, 2024). Women scientists have been pivotal in this process, leading studies on maternal and child health, improving disease surveillance, and shaping community-based public health interventions (Giampietro *et al*., 2014).

African women-led initiatives such as the **NASAC Women for Science Working Group** exemplify how science diplomacy can enhance data sharing, trust, and cross-country collaboration in health policy. Their engagement ensures that local perspectives are integrated into global strategies. Moreover, digital collaboration tools now allow women scientists

to contribute to global health dialogues even when travel is restricted, expanding their influence and visibility (Richelle, Mao, and Liebe, 2025).

To institutionalise these gains, African governments and partners need to:

- Begin building capacity and ethical frameworks to support the gradual inclusion of pregnant and lactating women in clinical trials, aligning with WHO's global agenda for fuller implementation by 2030.
- Strengthen maternal and community health surveillance systems using gender-sensitive metrics that capture not only maternal and neonatal outcomes but also the broader gendered health impacts of crises, including gender-based violence, mental health conditions, substance abuse, and malnutrition (Krubiner *et al*., 2019).
- Support mentorship and funding schemes for women's health researchers.
- Expand South–South and global partnerships — through platforms like the Belmont Forum — to facilitate shared innovation in health and pandemic resilience.

When women scientists lead research, advise policymakers, and advocate for inclusion, health diplomacy becomes not only more equitable but also more effective. Their contributions demonstrate that equity and excellence in science are mutually reinforcing.

2.4 Addressing Climate Change and Sustainable Development

Climate change poses one of the most profound challenges to Africa's sustainable development, magnifying existing social and economic inequalities. Although the continent contributes less than 4% of global greenhouse gas emissions (IPCC, 2022), it bears a disproportionate share of the impacts. Rising temperatures, erratic rainfall, desertification, and sea-level rise threaten agriculture, water resources, health systems, and infrastructure. Climate-induced disasters, including floods, droughts, wildfires, cyclones, hurricanes and typhoons, landslides, glacial retreat, and increased storm surges, are becoming more frequent and severe, pushing vulnerable populations deeper into poverty (Elasha, 2010).

Given these vulnerabilities, **Africa's active engagement in global climate governance is imperative.** Science diplomacy offers a pathway for African nations to participate meaningfully in international negotiations, influence global climate policies, and mobilise resources for adaptation and mitigation. Applying a **gender lens** to these dynamics reveals an even more complex picture: women, because of their central roles in agriculture, caregiving, and natural resource management, face unique barriers to adaptation and resilience while shouldering disproportionate burdens (Bryan *et al.*, 2024).

Climate projections indicate sharp declines in key staple crops across Africa. For instance, maize yields, a vital source of food and income, are expected to decrease by 14% in southern Africa by mid-21st century and by as much as 33% by 2100 under current emission trajectories (Asomah, 2024). Natural ecosystems such as forests, which often serve as safety nets in times of crisis, are also projected to degrade, reducing their capacity to provide essential goods and ecosystem services (Ribeiro *et al*., in press). These shifts directly threaten food security and deepen gender inequalities, particularly in rural communities.

Women, especially women scientists, are disproportionately affected in several ways:

- **Agriculture:** Women form most of the subsistence farmers but often lack secure land tenure, access to credit, and climate-smart agricultural inputs, factors that severely limit their adaptive capacity.
- **Ecosystem services:** The decline in forest and water resources, as well as food insecurity, forces women and girls to travel longer distances to collect fuelwood and water, exposing them to safety risks and diminishing time for education or income-generating activities.
- **Health:** Climate-related disease outbreaks increase caregiving responsibilities, compounding women's physical and emotional burden.
- **Energy:** Energy poverty remains highly gendered. Reliance on biomass for cooking exposes women to indoor air pollution and respiratory diseases, while limited access to clean energy technologies constrains productivity and well-being.

These interlocking pressures highlight how **climate change amplifies pre-existing gender disparities** in livelihoods, health, and decision-making power. Addressing them requires integrated responses that combine climate action, gender equity, and science diplomacy, ensuring that women's knowledge, leadership, and lived experiences inform both national and global solutions.

Crucially, addressing the twin challenges of climate change and development extends far beyond the natural sciences. Effective adaptation and mitigation strategies require the indispensable expertise of Social Scientists and Humanists to study human behaviour, community resilience, political economy, and climate justice. These disciplines ensure that scientific data is translated into policies that are equitable, context-specific, and politically feasible on the ground.

2.4.1 Integrating Gender into Sustainable Development Strategies

Achieving the Sustainable Development Goals (SDGs), particularly **SDG 5 (Gender Equality)** and **SDG 13 (Climate Action),** requires **gender-responsive policies** that both address women's specific vulnerabilities and harness their leadership in climate solutions. According to the UNDP, several enablers are essential for this transformation, including **dedicated funding, robust institutional frameworks,** and **inclusive planning processes** that elevate women's voices within national climate strategies. These translate into concrete measures (Achakpa, 2023):

- **Generate gender-disaggregated climate data** to inform targeted adaptation and mitigation actions.
- **Integrate gender perspectives** into second-generation Nationally Determined Contributions (NDCs), ensuring that targets and indicators capture women's roles, priorities, and needs.
- **Strengthen women's participation in governance** by reserving seats on climate-planning committees and supporting women-led community networks.
- **Build capacity for female researchers and practitioners** in climate science, policy, and green technologies.

- **Ensure equitable access to climate finance** by designing grant mechanisms that lower entry barriers for women entrepreneurs, cooperatives, and local innovators.

Embedding these strategies in national and regional development planning not only enhances **climate resilience** but also advances **social justice and economic empowerment,** making gender equity a cornerstone of effective climate action.

2.4.2 Science Diplomacy as an Enabler for Gender-Responsive Climate Action

Science diplomacy offers a vital bridge between researchers, policymakers, and international partners, enabling the integration of gender perspectives into climate initiatives. Platforms such as the **NASAC Women for Science (WfS) Working Group** webinar series exemplify how showcasing women's expertise in science and innovation fosters inclusive policy dialogues and cross-border collaboration. By elevating the visibility of women scientists and diplomats in multilateral forums, science diplomacy can:

- **Highlight gender-sensitive research priorities and best practices** that inform adaptation and mitigation policies.
- **Strengthen South–South collaboration** by leveraging locally developed knowledge, innovations, and technologies led by women.
- **Advance gender-responsive commitments** within bilateral, regional, and global climate agreements.
- **Mobilise resources and political will** to scale inclusive and community-driven climate solutions.

To harness science diplomacy effectively in building climate resilience and promoting sustainable development, Africa must pursue a set of actionable strategies:

I. ***Institutionalise Science Diplomacy Across Governance Structures***
African governments should embed science diplomacy within foreign ministries, research institutions, and regional bodies. This includes appointing science advisors, establishing dedicated units, and integrating scientific expertise into diplomatic missions (Gluckman

et al., 2017). Institutionalisation ensures continuity, coordination, and strategic engagement in global forums, enabling Africa to move from being a passive recipient of climate aid to an active architect of global climate solutions (Mbalisi *et al*., 2025).

II. *Invest in Scientific Infrastructure and Education*

Building climate resilience requires robust scientific and educational capacity. African countries must invest in research infrastructure, data systems, and higher education in climate science, environmental studies, and policy analysis (Daniels, Mba and Teferra, 2022). Strengthening universities, research centres, and innovation hubs will empower the continent to generate context-specific solutions and contribute to global knowledge production. International partnerships can enhance these efforts through training, technology transfer, and collaborative research.

III. *Promote Inclusive and Equitable Governance*

Science diplomacy must reflect the voices of **women, youth, Indigenous peoples, and marginalised communities** (Goveas and Sinha, 2024). Participatory approaches ensure that climate policies address diverse realities and priorities. Africa's Indigenous knowledge systems, rich in local adaptation practices, should be integrated into scientific and policy frameworks to strengthen resilience and align with global calls for inclusive climate action (Okedele *et al*., 2024).

IV.*Strengthen Regional Cooperation and Policy Harmonisation*

Fragmented regional efforts continue to hinder Africa's collective response to climate challenges (Henrico and Dobošb, 2024). Strengthening coordination platforms such as the **African Group of Negotiators** (AGN) and the **Pan African Climate Justice Alliance (PACJA)** will amplify Africa's unified voice in global negotiations and promote shared research agendas (Skah, 2022). Continental frameworks like the **African Union's STISA-2034** provide an enabling structure for cross-border collaboration, knowledge exchange, and policy harmonisation (African Union, 2020).

V. *Align National Policies with Global Climate Frameworks*

National climate strategies should be systematically aligned with global agreements and commitments. Using scientific evidence to guide implementation enhances coherence, transparency, and access to international support mechanisms (England *et al*., 2018). Such

alignment positions Africa to champion climate justice by reframing climate finance, adaptation, and loss-and-damage discussions as matters of equity and rights, rather than charity.

2.5 Confronting Security Threats: Women in Chemical, Biological, Radiological, and Nuclear (CBRN) Diplomacy

Chemical, Biological, Radiological, and Nuclear (CBRN) materials have become a major global security concern due to their **dual-use nature,** where legitimate scientific, medical, and industrial applications coexist with the risk of weaponisation. This overlap creates complex non-proliferation challenges (Crowley and Dando, 2014). These materials encompass industrial chemicals, pharmaceutical precursors used in research, biological pathogens, and radioactive isotopes. While many serve peaceful purposes, they can be intentionally misused for military or terrorist objectives, blurring the line between safety and security (Tin *et al*., 2023).

If mishandled, CBRN agents can cause mass casualties (Haslam *et al*., 2021), severe economic disruption, and long-term environmental and societal instability. Mitigating these risks demands **multi-layered monitoring systems** capable of distinguishing legitimate research from potential threats (Carter *et al*., 2020). Effective management requires global frameworks that prevent misuse while safeguarding scientific progress, supported by international cooperation to prohibit the development and stockpiling of hazardous materials (Marshall *et al*., 2023). However, such cooperation is often constrained by political asymmetries, resource disparities, and limited trust.

Science diplomacy offers a powerful mechanism to bridge these divides, creating **neutral, evidence-based platforms** for dialogue, building confidence between states, and fostering inclusive, anticipatory governance where traditional diplomacy may fall short (Flink and Schreiterer, 2010).

Within this context, three dimensions of science diplomacy are particularly relevant:

- **Science in diplomacy** applies scientific expertise to inform foreign policy and build trust through technical cooperation (Carter *et al*., 2020).
- **Science for diplomacy** promotes international goodwill through joint research, data exchange, and collaborative innovation (Marshall *et al*., 2023).
- **Diplomacy for science** enables cross-border scientific cooperation, ensuring transparency and ethical conduct in sensitive research domains (Flink and Schreiterer, 2010).

Together, these dimensions underpin an inclusive and cooperative framework for addressing CBRN security challenges.

2.5.1 Role of Women in CBRN Diplomacy

Addressing CBRN security challenges requires **inclusive, interdisciplinary collaboration** across research, governance, and diplomacy. Yet, despite growing recognition of the need for equity, **women remain underrepresented** in CBRN-related roles due to systemic barriers such as regulatory constraints, economic limitations, and persistent sociocultural biases. For instance, women account for only **31% of heads of disarmament delegations worldwide** (UNODA, 2023), revealing enduring gender gaps in technical and policy leadership.

Excluding women from CBRN diplomacy not only limits innovation but also undermines the legitimacy and effectiveness of global security frameworks. Conversely, **gender-diverse teams** tend to identify dual-use risks earlier (UNICRI, 2022), produce more comprehensive risk assessments, and secure stronger community buy-in for preparedness initiatives. Incorporating women's perspectives strengthens decision-making quality, ethical foresight, and crisis communication, qualities central to effective CBRN governance (United Nations Security Council, 2023).

Women bring more than representation; they contribute **interdisciplinary thinking, ethical sensitivity, and community-based insight** that are essential for risk assessment, crisis management, and public engagement (UNICRI, 2022). Their participation enhances transparency, builds public trust, and ensures that security measures align with social and ethical norms.

Against this backdrop, international institutions have intensified efforts to promote women's participation in CBRN diplomacy. The **Organisation for the Prohibition of Chemical Weapons (OPCW)** is a leading actor in this space. With a mandate grounded in the **Chemical Weapons Convention,** the OPCW brings together scientists, diplomats, technologists, and policymakers to strengthen global mechanisms that prevent chemical threats and promote peaceful chemistry.

A key dimension of OPCW's work is **capacity building and skills development.** The organisation trains women scientists in chemical safety and emergency response, while also promoting education and professional development opportunities tailored to women in chemistry and related fields. The annual **Women in Chemistry Symposium** serves as a flagship platform for visibility and mentorship, strengthening women's capacities in chemical safety and security, particularly among those from underrepresented regions.

At the March 2025 Symposium, **Ms. Mesha Mbisana,** a PhD candidate from the University of Botswana, described the forum as "*a vibrant space for learning, networking, and inspiration among emerging and established women scientists*". These gatherings not only enhance technical competence but also foster solidarity, leadership, and the exchange of innovative approaches to chemical security.

The **OPCW Associate Programme** has also trained African scientists, including women, in chemical safety and incident response (OPCW African Bulletin, 2020). Through these initiatives, science diplomacy has helped build a **multidisciplinary ecosystem** for cooperation, trust-building, and policy influence (Fouzi *et al*., 2024). Inclusive OPCW workshops held in Namibia and Zimbabwe have further enhanced preparedness, expanded women's participation, and strengthened regional collaboration in chemical security.

Together, these efforts underscore the transformative potential of women's leadership in CBRN diplomacy, advancing not only technical excellence but also ethical and inclusive governance for global peace and security.

2.5.2 *CASE STUDY:* Dr. Janes Mokgadi – Leading Botswana's CBRN Strategy

Managing CBRN threats requires specialised skills, coordinated systems, and leadership grounded in science diplomacy. **Dr Janes Mokgadi,** profiled in UNICRI Issue 400, exemplifies how women can shape this complex field through technical expertise and strategic vision. With a background in chemistry, forensic science, and energy research, Dr Mokgadi bridges science and policy to advance Botswana's CBRN governance.

Under her leadership, Botswana has institutionalised its participation in global disarmament forums and strengthened compliance with the Biological and Chemical Weapons Conventions, an important demonstration of **science diplomacy at the institutional level.** Her office has co-organised regional workshops with the **United Nations Office for Disarmament Affairs (UNODA)** and the **Stimson Centre,** training officials from Namibia, Rwanda, and Zambia. These initiatives foster **South–South cooperation** and build regional communities of practice, using science diplomacy as a tool for trust-building, knowledge exchange, and harmonised crisis response.

Among her key achievements is Botswana's **National Action Plan on UN Security Council Resolution 1540,** developed through broad, inclusive consultations. Dr Mokgadi also mobilised support from the **OPCW** and the **EU Partner-2-Partner Export Control Programme,** positioning Botswana as a regional hub for CBRN knowledge exchange. Her ability to align technical expertise with political will, navigating the 1540 Committee's matchmaking process and securing high-level government buy-in, demonstrates why women's participation is vital at decision-making tables. Her leadership shows that women are not merely participants but **architects of inclusive, resilient security systems.**

Across Africa, other women are making similar strides. Leaders such as **Sandra Matinyi (Uganda)** and **Musonda Mandona (Zambia)** advance biosafety and biosecurity initiatives under **Project 99 BIOCAP-ECA,** connecting sectors, guiding outreach on dual-use technologies, and

strengthening crisis response. Their work underscores the importance of **representation, mentorship, and inclusive governance.** *Project 99 BIOCAP-ECA* is an EU-funded initiative to enhance biosafety and biosecurity capabilities in 11 countries in East and Central Africa, including Burundi, DRC, Ethiopia, Ghana, Kenya, Malawi, Rwanda, Seychelles, Tanzania, Uganda, and Zambia.

Scaling these successes will require **investment in gender-focused research, institutional reforms, and regional frameworks** (Niklasson and Towns, 2023). Programmes like Women in Chemistry should be expanded and supported by sustained **political commitment and funding** (Higgott and Reid, 2023) to ensure that women continue to shape CBRN diplomacy and global security.

2.6 Advancing Peacebuilding and Post-Conflict Recovery

Conflict disrupts every facet of life, mobility, communication, and governance, eroding the very systems that sustain peace and knowledge exchange. In many regions, researchers and professionals face threats that compromise both personal safety and scientific integrity. **Abductions, harassment, and deportations** of scholars in conflict-affected areas have become increasingly common, reflecting a broader pattern of impunity by state-affiliated and non-state actors.

The **Stockholm International Peace Research Institute (SIPRI)** highlights these realities in the *Liptako-Gourma region* of Burkina Faso, Mali, and Niger, where researchers working on humanitarian protection projects face escalating risks from restricted access and armed threats to difficulties in forming safe, reliable data collection teams (Deb and Baudais, 2022). Similarly, the **International Human Rights Network of Academies and Scholarly Societies (IHRN, 2024)** reports that violence against health professionals has surged, with over **3,600 incidents** of violence or obstruction against health care recorded globally in 2024, particularly in **Gaza and the West Bank.** These attacks, which violate international humanitarian law, undermine the fragile structures necessary for post-conflict recovery.

Academic freedom also suffers in times of conflict. Even in stable contexts, political interference can erode trust in science. Recent developments in the United States, where executive orders curtailed research on diversity, equity, inclusion, and accessibility, have created a chilling effect, leading to self-censorship and the removal of critical public health information from official platforms. Such suppression of scientific inquiry threatens democratic governance, stifles innovation, and erodes public confidence in science, particularly in fields vital to public health and social equity.

These realities underscore an urgent need for **science diplomacy** to prioritise the protection of researchers and academics as a core component of international engagement. Field scientists working in volatile contexts require **diplomatic safeguards, institutional support, and coordinated response mechanisms.** Academic institutions, in turn, must act as diplomatic actors, leveraging their networks to advocate for the safety, release, and well-being of scholars in danger.

2.6.1 Gendered Realities of Conflict and Research

Women face disproportionate risks in conflict zones, particularly as frontline health workers, caregivers, and community responders. They are more exposed to **gender-based violence,** limited legal protection, and restricted access to reproductive and maternal health services, all of which worsen health outcomes and impede recovery. Moreover, women's exclusion from decision-making platforms during and after conflict often silences perspectives essential for inclusive peacebuilding.

The case of **Elizabeth Tsurkov,** a PhD candidate at Princeton University, abducted during fieldwork, illustrates the compounded vulnerabilities faced by women researchers (Bonette, 2023). Her medical condition and limited access to treatment during captivity highlight the intersection of gender, health, and security risks in field-based research.

Women from marginalised or undocumented backgrounds face additional barriers, including immigration enforcement, lack of legal protection, and economic insecurity, which heighten exposure to exploitation and violence. Addressing these challenges requires **gender-sensitive research protocols, institutional safeguards, and support systems** tailored to women's specific risks in conflict and post-conflict settings.

2.6.2 Science Diplomacy as a Pathway to Protection and Peace

When informed by gender perspectives and grounded in human rights, **science diplomacy** becomes a transformative tool for peacebuilding and post-conflict recovery. It enables researchers, institutions, and communities to collaborate across borders, challenge injustice, and rebuild societies rooted in dignity and resilience. Increasingly, science diplomacy is being mobilised as a **mechanism for conflict resolution.** Embedded within foreign affairs frameworks, it leverages the **universal language of evidence and ethics** to foster collaboration across political and ideological divides. As Langenhove, Piaget, and Soete (2022) observe, scientists share a common language of inquiry that can build trust even amid geopolitical tensions.

Science diplomacy can therefore:

- Advocate for **protective protocols and international safeguards** for researchers in conflict zones, including pre-deployment risk assessments, host-country agreements, and emergency response mechanisms.
- Promote **trust and transparency,** ensuring scientific work remains a global public good free from political manipulation.
- Integrate **gender-sensitive approaches,** prioritising the safety, dignity, and participation of women in all stages of field research and policy response.
- Defend **academic freedom** as a pillar of democracy, ensuring researchers can pursue and publish knowledge without coercion or censorship.

2.6.3 Scientific Institutions as Diplomatic Agents

Scientific institutions, including academies, universities, and scholarly societies, have a vital role as **diplomatic actors** in defending human rights and academic freedom. Their authority allows them to challenge repression, promote open inquiry, and counter authoritarian tendencies. By issuing **public statements, solidarity calls, and advocacy briefs,** such institutions can mobilise international pressure and moral support to protect vulnerable researchers.

Universities can serve as **diplomatic intermediaries,** engaging governments and global organisations to advocate for scholars' safety. They can safeguard **data privacy,** shield immigrant students and academics from state enforcement, and offer **legal, financial, and psychosocial support.** In doing so, they uphold human rights while fostering safe environments for knowledge exchange. Education, therefore, becomes a **frontline for human rights,** where institutions resist oppression and promote inclusive, rights-based frameworks for peace and stability.

Across Africa, **science academies** are emerging as key players in integrating human rights within scientific practice. Institutions such as the **NASAC** and the **Science Diplomacy Capital for Africa (SDCfA)** are bridging research and policy, building institutional capacity, and strengthening evidence-based decision-making across the continent (SDCfA, 2025). Through multilateral collaboration in science, technology, and innovation, these platforms address challenges such as **climate change, food insecurity, and poverty.** Their work illustrates how science diplomacy, when locally grounded yet globally engaged, can transform research into a force for **peace, justice, and resilience** (NASAC, 2025).

2.7 Shaping the Science–Policy Interface: Women's leadership at negotiation tables

At the intersection of science and policy, individual leadership becomes the bridge through which evidence informs governance and diplomacy translates knowledge into action. Understanding how women scientists navigate and influence this interface is therefore essential to grasping how inclusive leadership reshapes decision-making, negotiation, and institutional reform across Africa. Their contributions often extend beyond traditional research spaces into negotiation, mediation, and institutional reform. Yet their influence remains under-recognised in global narratives. Recognising women's leadership at the science–policy interface is therefore essential to understanding how societies translate knowledge into action. This section highlights **Professor Benigna Zimba,** whose scholarship and leadership exemplify how women transform the pursuit of knowledge into a force for peace, equity, and sustainable development.

2.7.1 Context: The Visibility of Women in Science–Policy and Peace Diplomacy

As Candido (2020) observes, *one cannot make general assumptions when analysing exceptional lives*. Though written in reference to women exploited during colonial times, the statement aptly frames the current stage of women's empowerment. Progress is not uniform; each woman's path reflects a distinctive blend of knowledge, resilience, and circumstance. Understanding these individual trajectories is vital when examining women's impact on science diplomacy and policymaking in Africa, where structural inequalities still limit visibility and participation. Against this backdrop, the career of Professor Benigna Zimba demonstrates how scholarly excellence can evolve into influential leadership within both academic and diplomatic arenas.

2.7.2 Profile and Scholarship: Professor Benigna Zimba and the Study of the Global Slave Diaspora

Professor Zimba is a retired Associate Professor whose distinguished four-decade career bridges women and gender studies, oral history, research methodology, and the study of memory, culture, and identity. Through this multidisciplinary work, she has advanced modern African historiography and inspired a generation of social-science scholars.

Her intellectual legacy is anchored in research on **enslavement** within colonial Mozambique, Southeast Africa, and the **Global Slave Diaspora in the Western Indian Ocean.** Mozambique occupies a central position in this historical network of economies built on slavery that sustained imperial European structures of colonisation and domination (Zimba, 2025). By recovering the voices and agency of enslaved peoples, Zimba challenges Eurocentric narratives and reframes Africa's contribution to global history.

For more than fifteen years, she served as a consultant to the **Truth and Justice Commission – Mauritius,** advocating recognition of the enduring legacies of slavery and for reparative justice. Her work expands beyond academia into public education and policy influence. As **Conceptor, Co-founder, and President of the Scientific Committee** of the **Intercontinental Slavery Museum** in Mauritius, she leads efforts to reinterpret global slavery

through a human-centred lens that foregrounds resilience, memory, and dignity (Chen-Carrel, 2021).

Her collaborations with **UNESCO** and other **United Nations** bodies, including the *Routes of Enslaved Peoples* initiative and the *Committee of Cultural Diversity*, demonstrate how scholarship can inform international policy. By situating slavery within frameworks of human rights and cultural diversity, she contributes to the global discourse on historical justice while strengthening Africa's intellectual voice. Through this work, Professor Zimba illustrates how scientific and historical inquiry can underpin diplomacy, reconciliation, and peacebuilding.

2.7.3 Contributions to Higher Education and Institutional Leadership

Beyond her research, Professor Zimba has been a transformative force in African higher education. She was among the founders of the **Pedagogical University of Mozambique,** which redefined teacher education in the post-independence era by linking pedagogy to national development and cultural identity. At **Eduardo Mondlane University,** she helped establish the **Faculty of Arts and Social Sciences,** now one of the institution's largest and most vibrant faculties. These initiatives expanded opportunities for women academics and strengthened the social-science foundations essential for inclusive governance.

Her continental contributions include serving as the **sole female co-founder and Interim Vice-Rector of the Pan African University (PAU)** under the **African Union,** where she promoted gender equity and interdisciplinarity in postgraduate training. She also served as **Vice-President of the Organisation for Social Science Research in Eastern and Southern Africa (OSSREA),** advocating policy-relevant research and collaboration across more than twenty countries. Through these roles, she championed the use of social science evidence in shaping national and regional policies.

In recent years, Professor Zimba has applied her expertise to Mozambique's governance processes. She serves on **CREMOD,** an advisory board addressing decentralisation in finance, education, and health, and was appointed to the **Technical Commission for National and Inclusive**

Dialogue (COTE), where she leads the **Working Group on National Reconciliation.** Her leadership in these forums underscores how women scholars can bridge academia and statecraft, using dialogue and evidence to advance peace and social cohesion.

2.7.4 Reflection: Women as Architects of Inclusive Governance

Professor Zimba's trajectory, from historian to policy advisor, illustrates how women transform intellectual capital into social and diplomatic impact. Her achievements reaffirm that empowered women are central to Africa's development: they drive institutional innovation, preserve cultural memory, and shape inclusive policies. Her example also demonstrates that Africa's progress in science diplomacy depends not only on technical expertise but on moral courage, historical understanding, and the capacity to humanise policy. Recognising and supporting women like Professor Zimba is essential for building sustainable science–policy ecosystems in Africa. Their leadership transforms the negotiation table from a site of power imbalance into a platform for shared vision, reconciliation, and collective progress.

2.8 War on Gender and Education in Sudan: A Call for Gender-Sensitive Recovery

Since the conflict broke out in April 2023, Sudan's education system has been devastated, with gendered consequences threatening to reverse decades of progress. The destruction of schools, mass displacement, and the collapse of public infrastructure have created a crisis with extremely disastrous effects on girls and young women. According to UN Women (2024), over 2.5 million school-age girls are at risk of dropping out of school due to displacement, insecurity, and the physical destruction of educational facilities (UN Women, 2024).

The closure of schools has triggered a cascade of harmful coping mechanisms. Families, facing economic hardship and insecurity, increasingly resort to child marriage as a perceived form of protection or financial relief. ACAPS (2024) reports a sharp rise in early marriages, especially in conflict-affected regions such as Darfur, Khartoum, and parts

of Kordofan. These decisions, often made under pressure, rob girls of their independence, education, and future opportunities. In regions like Darfur and Khartoum, the risks are even more acute. Girls face heightened exposure to sexual violence, forced marriage, and recruitment into domestic labour, while boys are increasingly targeted for recruitment into armed groups, exposing them to trauma and long-term psychological harm (ACAPS, 2024). These patterns reveal how access to education has been weaponised during conflict, not only as a casualty of war but as a tool of control and exclusion.

2.8.1 Deepening Gender Inequalities and Emerging Resilience

The gendered nature of this educational crisis is rooted in longstanding structural inequalities. Even before the current conflict, girls in many parts of Sudan faced barriers to education, including poverty, early marriage, and limited access to menstrual hygiene products and safe school environments. War has intensified these challenges, turning classrooms into battlegrounds and stripping away the few protections that existed. Yet, amid this devastation, stories of resilience persist. Schools such as Al-Qadisiya in Port Sudan have become shelters of hope. Despite overcrowded classrooms, limited resources, and the trauma of displacement, girls continue to express ambitions to become doctors, teachers, and engineers. Oliver (2025) documents how these students, many of whom have lost family members or homes, still cling to their dreams with remarkable determination. These stories illustrate the transformative power of education, even in the harshest conditions.

2.8.2 Towards a Gender-Sensitive Recovery and Future

To harness this resilience and prevent further erosion of educational gains, Sudan must adopt a recovery strategy that places gender at its core. Education must be recognised not only as a right, but as a protective and transformative instrument. A gender-sensitive recovery framework should address both immediate and structural barriers to education, health, and economic participation. This means rebuilding schools with safety and accessibility in mind, ensuring that girls have access to secure facilities, female teachers, and gender-sensitive curricula. It also means investing in psychosocial support for children affected by trauma and

creating pathways for reintegration into formal education, especially for those who have been married or recruited into armed groups.

At the policy level, Sudan's recovery must include targeted funding for girls' education, gender-disaggregated data collection, and accountability mechanisms to monitor progress. International partners, including UN agencies and regional bodies, must support these efforts with flexible, context-sensitive programming. Diaspora-led initiatives can also bridge global expertise with local needs, mobilising resources, amplifying voices, and shaping policy from the grassroots up.

Ultimately, the war on education is a war on Sudan's future. If girls are denied the right to learn, the country fails its potential for inclusive recovery, innovation, and peace. But if education is protected and prioritised, especially for those most at risk, it can become the foundation for healing, empowerment, and long-term resilience.

2.8.3 Science in the Shadow of War: The Story of Dr. Hala Taha Elbashir

While Sudan's conflict has crippled basic education, its impact extends deeply into higher education and scientific research, sectors where women have fought hard for visibility and participation. The struggles of Sudanese female researchers, such as Dr. Hala Taha Elbashir, reflect the broader gendered toll of war on knowledge production, professional continuity, and national development.

Before the outbreak of war in Sudan in April 2023, Dr. Elbashir was based in Wad Madani, Al Gezira State, pursuing doctoral research on *Schistosoma haematobium*, the parasite responsible for urogenital schistosomiasis. Her work focused on the parasite's transcriptional response to treatment, with a special emphasis on female genital schistosomiasis, a neglected condition that disproportionately affects women in under-resourced communities. When the conflict reached her region, armed forces attacked her home. Her family endured violence, and she was forced to flee, leaving behind her laboratory, research samples, and years of data. The family eventually reached Kenya, where her husband underwent emergency surgery for injuries sustained during the attack.

Living with multiple sclerosis (MS), displacement severely disrupted Dr. Elbashir's access to treatment and medication. In Nairobi, the limited availability of therapies has worsened her condition, while the loss of income and research funding has created immense financial strain.

Despite these hardships, she continues to engage in remote collaborations, scientific writing, and advocacy for women affected by neglected tropical diseases (NTDs), particularly in fragile and conflict-affected settings. Her story captures the broader struggles of many scientists, especially women, who persist in contributing to global health under conditions of displacement and uncertainty.

The case of Sudan highlights the urgency of safeguarding research during times of conflict. Genuine, sustained support, through flexible funding, inclusive policies, and international solidarity, is vital to ensure that essential research, especially on neglected diseases such as schistosomiasis, continues even in the shadow of war.

2.8 Conclusion

Across all these thematic areas, from water security to peacebuilding, African women scientists are proving that inclusivity is not a peripheral concern but a prerequisite for progress. Their leadership strengthens Africa's capacity to engage globally, craft solutions grounded in evidence and ensure that diplomacy reflects the lived realities of its people. Science diplomacy, when gender-responsive, becomes not just a tool of negotiation but a **bridge of transformation,** linking science, policy, and humanity.

AFRICAN INSTITUTIONS DRIVING INCLUSIVE SCIENCE DIPLOMACY

3

3.1. Introduction

Institutions are the backbone of inclusive science diplomacy in Africa. They convene expertise, translate scientific evidence into policy, and provide the platforms through which African scientists, particularly women, engage in regional and global decision-making. African institutions play a pivotal role in this process. This is vital where gender disparities and capacity gaps still constrain participation in science, technology, and innovation (STI). Through dialogue and cooperation, these institutions strengthen Africa's credibility and influence in global forums.

The institutional ecosystem is diverse, spanning academies of science, regional communities, professional associations, and international networks. Together, they connect research and diplomacy through policy briefs, fellowships, and continental dialogues aligned with *Agenda 2063* and *STISA-2034*. Many now prioritise gender equity, ensuring women's expertise is visible in areas such as climate resilience, health diplomacy, and peacebuilding.

Despite progress, African institutions face persistent challenges: limited funding, fragmented mandates, and donor dependence. Gender mainstreaming is uneven, and science diplomacy remains weakly institutionalised in many policy frameworks. Addressing these gaps requires coordination, sustainable investment, and deliberate inclusion of women in leadership.

This chapter explores how African institutions advance inclusive science diplomacy across four dimensions:

- The institutional landscape supporting Africa's scientific voice (Section 3.2);
- Programmes and fellowships that build capacity (Section 3.3);

- Policies promoting gender equity (Section 3.4); and
- Cooperative mechanisms linking Africa to global networks (Section 3.5).

3.2 Institutional Landscape

Science diplomacy in Africa is anchored in a constellation of institutions that mobilise knowledge, shape policy, and build capacity across the continent. While African states and the African Union (AU) provide the overarching political framework for science, technology, and innovation (STI), much of the operational leadership comes from intermediary bodies, networks of academies, professional associations, regional economic communities, and global organisations with African chapters. Together, these actors provide platforms for inclusive science diplomacy, ensuring that women scientists and early-career researchers contribute to shaping policy and international collaboration.

3.2.1 IAP: A Global Platform for Science Diplomacy

At the global level, the **InterAcademy Partnership (IAP)** serves as the umbrella organisation connecting more than 150 national, regional, and global academies of science, medicine, and engineering. IAP's mission is to harness the collective expertise of academies to provide independent, evidence-based advice on issues of global concern, including health, climate change, and sustainable development. Its work advances science diplomacy by fostering collaboration among academies across geopolitical boundaries and facilitating their engagement with international policy processes such as the United Nations Sustainable Development Goals (SDGs) and the Paris Agreement. IAP's gender and inclusion agenda has become increasingly central to its programmes, ensuring that women scientists play active roles in global advisory mechanisms and high-level dialogues on science and policy.

Through initiatives such as the **IAP Women for Science (WfS) Programme** and the **IAP–INGSA collaboration on science advice,** the partnership promotes inclusivity, capacity-building, and knowledge exchange across regions. It also provides a platform for African academies to participate in

global scientific assessments and policy consultations, strengthening their voice in international fora. By connecting African science academies to their counterparts worldwide, IAP supports institutional learning, shared values of scientific integrity, and advocacy for gender-responsive science-policy systems.

3.2.2 NASAC: A Regional Hub for Science Diplomacy

The **Network of African Science Academies (NASAC),** established in 2001, has become a leading convener of scientific expertise across the continent. Comprising 32 member academies, NASAC strengthens institutional capacity, amplifies African scientific voices, and engages directly with continental and global policy processes. Its contributions include evidence-informed policy briefs, coordination of the **Annual Meeting of African Science Academies (AMASA),** and collaboration with international partners such as IAP, the **International Science Council (ISC),** and the **International Network for Government Science Advice (INGSA).** Since 2015, NASAC has served as the IAP's affiliate member for Africa, linking continental priorities to global science-policy discussions.

NASAC's inclusivity agenda has gained momentum through support for women scientists and the growth of **National Young Academies (NYAs).** These platforms enable early-career and women researchers to participate in STI policy debates and strengthen regional cooperation. Through its flagship **Women for Science (WfS) Working Group,** NASAC demonstrates how African academies can embed gender-responsive approaches into science diplomacy, ensuring that women's expertise shapes policy, diplomacy, and institutional transformation across Africa.

3.2.3 EASAC's Commitment to Gender Equality

The **European Academies' Science Advisory Council (EASAC)** strengthens science diplomacy by promoting evidence-based policy advice and fostering collaboration between scientists and policymakers. Guided by its Statutes and procedures, EASAC embeds diversity, including gender equality, across its structures. This commitment aligns with **SDG 5 (Gender Equality),** integrating gender perspectives into international science-policy dialogues and advancing inclusive decision-making.

EASAC's progress is reflected in the growing representation of women across its leadership: more women now serve as Presidents and Vice-Presidents, and female scientists co-chair key panels. For instance, the *Energy Steering Panel* and *Working Group on Security of Sustainable Energy Supplies* are both led by women; others on *Decarbonisation of Buildings, Transport, and Forestry* similarly include female leadership. These examples show that empowering women strengthens science diplomacy and enhances the legitimacy and impact of scientific policy advice.

3.2.4 OWSD: Empowering Women in Science

The **Organisation for Women in Science for the Developing World (OWSD),** hosted by UNESCO and TWAS, is instrumental in advancing women's scientific leadership in Africa. With national chapters in more than 20 countries, OWSD provides fellowships, mentorship, and professional development opportunities that increase women's participation in science-policy spaces. Its PhD and Early Career Fellowships have supported hundreds of African women pursuing research in strategic areas such as climate change, health, and sustainable development (OWSD, 2023). OWSD chapters also engage in advocacy and policy dialogue, ensuring that women's perspectives inform national and regional STI strategies. The growing visibility of OWSD alumni in universities, ministries, and international organisations demonstrates the long-term impact of institutional investment in women's scientific leadership.

3.2.5 INGSA-Africa: Building Capacity for Evidence-Informed Policy

The **International Network for Government Science Advice (INGSA),** founded in 2014, provides a global platform for improving science advice to governments. Its regional chapter, **INGSA-Africa,** has expanded rapidly, offering training workshops, policy labs, and dialogues that strengthen links between evidence and decision-making (Ekeanyanwu, 2024). INGSA-Africa's strength lies in inclusivity. Recruiting women scientists and early-career researchers from underrepresented regions ensures diversity in science-policy engagement. Collaboration with AU frameworks such as *STISA-2034* further supports gender-responsive policymaking (INGSA-

Africa, 2020). This alignment positions INGSA-Africa as a key driver of inclusive science diplomacy across the continent.

3.2.6 Continental and Regional Mechanisms for Advancing STI and Gender-Inclusive Diplomacy

The African Union's governance ecosystem — comprising the African Union Commission (AUC), AUDA-NEPAD, and the Regional Economic Communities (RECs) — collectively drives Africa's science, technology, and innovation (STI) agenda. At the continental level, the AUC provides strategic leadership through frameworks such as Agenda 2063 and STISA-2034, which position inclusive participation in STI as central to Africa's transformation. AUDA-NEPAD translates these commitments into practice through programmes including the African Biosciences Initiative, the Africa Women in Science Programme, and platforms on climate change, food security, and health, thereby elevating women's contributions to AU-led policy processes and science diplomacy.

Regionally, RECs such as the Southern African Development Community (SADC) integrate STI into broader economic and development priorities. The SADC Protocol on Science, Technology, and Innovation (2017) promotes regional collaboration, renewable energy and climate adaptation initiatives, and gender mainstreaming across technical committees and centres of excellence. These regional mechanisms reinforce continental priorities and amplify Africa's collective bargaining power in global fora.

Together, the AUC, AUDA-NEPAD, and the RECs form a coherent and mutually reinforcing system that advances STI capacity, strengthens gender-responsive governance, and supports Africa's engagement in international science diplomacy.

3.3 Institutional Programmes and Fellowships Advancing Inclusive Science Diplomacy

Institutional programmes and fellowships remain among the most effective instruments for advancing inclusive science diplomacy in Africa. They create structured pathways for women and early-career scientists to acquire skills, build networks, and establish credibility in policy engagement (Asiedu,

2023). Beyond individual training, these initiatives cultivate communities of practice that sustain gender equity within institutions and ensure that women's voices shape science-policy dialogues. A few examples of these programmes are highlighted below.

3.3.1 The UNESCO Chair for Water, Women and Decision-Making Power

Established in 2006 in Côte d'Ivoire under the leadership of Professor Euphrasie Kouassi Yao, the UNESCO Chair Water, Women and Decision-Making Power demonstrates how gender equality and sustainable resource management reinforce one another (UNESCO, 2025). The **Compendium of Women's Skills in Côte d'Ivoire** (2017) enhances visibility for women experts and strengthens their participation in decision-making through mentorship and peer exchange.

Its flagship concept of Gender Engineering embeds gender analysis in project design and evaluation through two key programmes:

- A **Training Programme** on gender audits, budgeting, climate, and security; and
- A **Master's Programme** in Gender, Economics and Sustainable Water Management.

To disseminate research, the Chair founded *Equal Opportunity Press*, promoting African scholarship on gender and sustainable development.

3.3.2 OWSD Fellowships: Building Scientific Leadership

The Organisation for Women in Science for the Developing World (OWSD) provides PhD and Early Career Fellowships that combine funding, mentorship, and international exposure (OWSD, 2025). Alumni now occupy senior positions as deans, institute directors, and policy advisers (OWSD, 2023). Many initiate outreach programmes in their home institutions, mentoring peers and linking research to policy. These ripple effects transform individual advancement into systemic leadership for women in science.

3.3.3 Women in Science Without Borders (WISWB)

Women in Science Without Borders (WISWB), a gender-inclusive initiative, was founded by Professor Amal Amin, a distinguished polymer technology and chemistry expert at the National Research Centre in Egypt. It is a free networking platform that connects scientists with multi- and trans-disciplinary stakeholders across industry, policy, private sectors, NGOs, media, and the public to utilize science for societal development. WISWB is now active in 92 countries and recognised by UNESCO. Its expansion to other countries is a great science diplomacy example in itself and proof that leadership and transformative ideas can originate from the Global South, breaking the ceiling of expectations. It offers a space where science serves as a neutral tool, free from political, religious, or cultural borders.

3.3.4 INGSA-Africa Policy Labs and Training

The International Network for Government Science Advice (INGSA-Africa) builds practical science-advice capacity through *Policy Labs and Fellowships*. Participants work directly with government officials on policy challenges; for example, a 2022 lab in South Africa on pandemic preparedness included over 50 % women (INGSA-Africa, 2022). The programme's emphasis on communication and negotiation equips women scientists to effectively bridge the gap between evidence and governance.

3.3.5 Case Studies of Institutional Impact

OWSD Early Career Fellows in Climate Diplomacy: In Uganda, an OWSD fellow used her research on smallholder women farmers to inform national adaptation plans, influencing the Ministry of Agriculture to adopt gender-responsive strategies. Her participation in COP26 illustrates how fellowships translate into global diplomacy (OWSD, 2025).

INGSA-Africa Fellows in Pandemic Preparedness: During COVID-19, fellows advised health ministries in Kenya and Nigeria on community engagement and vaccine rollout. Women participants bridged technical evidence and cultural insight, elevating women's visibility in crisis diplomacy.

3.3.6 Lessons Learned from the Programmes and Fellowships

Persistent challenges include funding instability, unequal regional access, and institutional cultures that undervalue science-policy work. Sustained inclusivity demands mentorship, institutional recognition, and integration into national policy systems. Linking fellowships to continental frameworks – such as STISA-2034 and Agenda 2063 – and creating alumni networks enhances their long-term impact.

In conclusion, programmes and fellowships strengthen Africa's science diplomacy by turning potential into participation. They build a cadre of experts – especially women – who operate confidently at the science-policy interface. To secure their legacy, policies and institutional frameworks must be anchored within sustainable governance systems.

3.4 Policies and Frameworks

Sustaining inclusivity in science diplomacy requires robust governance frameworks that embed gender equity into science, technology, and innovation (STI). Across Africa, governments, regional bodies, and continental organisations have adopted measures that formalize equality, allocate resources, and enforce accountability.

3.4.1 Continental Policy Frameworks

The **African Union's Agenda 2063** identifies gender equality as a cross-cutting principle, while the **Science, Technology and Innovation Strategy for Africa** (STISA-2034) promotes human-capital development and gender mainstreaming (African Union, 2015; 2020). Together, they provide the normative foundation for inclusive STI governance.

3.4.2 National Gender and STI Policies

Examples of national leadership include:

- **Kenya's STI Policy (2020–2030)** mandating gender-responsive budgeting and dedicated funding for women-led research (Ministry of Education, 2020).

- **South Africa's White Paper on STI (2019)** introducing a Gender Equality Framework (Department of Science and Innovation, 2019).
- **Nigeria's STI Policy (2022)** mainstreaming gender across research councils and delegations.

Effectiveness, however, hinges on implementation, monitoring, and resource commitment.

3.4.3 Regional and International Alignment

RECs add an accountability layer. The **SADC Protocol on STI** requires annual gender-mainstreaming reports (SADC, 2017), and **ECREEE's Gender Strategy** advances women's participation in energy governance (ECREEE, 2015). These complement global commitments such as the **UN SDGs (5 & 9)** and UNESCO's **Recommendation on Science and Scientific Researchers** (2017), which African institutions leverage to attract equitable partnerships.

3.4.4 Pathways to Reform

Despite growing policy commitments to gender equity, significant implementation gaps persist across Africa's science diplomacy landscape. Many frameworks lack adequate financing, measurable indicators, or clear accountability structures, while institutional biases and fragmented reporting weaken enforcement. As a result, well-intentioned policies often remain aspirational rather than transformative.

To bridge these gaps, a new generation of reforms is emerging that focuses on structural and systemic change. Promising strategies include:

- **Gender-responsive budgeting** that directly links financial resources to equity outcomes;
- **Data-driven monitoring systems** using gender-disaggregated indicators to track institutional progress;
- **Cross-institutional learning platforms** that facilitate knowledge exchange and the scaling of good practices; and
- **Legal reinforcement** through constitutional and statutory provisions that make gender equity enforceable rather than optional.

Moving beyond token representation requires embedding women's leadership and decision-making authority at every level of science diplomacy. By institutionalising gender equity through law, budgets, and robust evaluation frameworks, African governments and regional bodies can transform policy commitments into measurable and lasting progress.

3.5 Facilitating Cooperation

Inclusive science diplomacy depends on collaboration across national, regional, and global levels. African institutions increasingly broker such cooperation by linking scientists and policymakers, aligning regional strategies with global agendas, and ensuring that women and marginalised groups participate fully in international partnerships. These efforts affirm Africa's role as a co-architect of global science governance.

3.5.1 Barriers to Inclusive Cooperation

Key obstacles remain:

- **Resource asymmetries** create dependency in international partnerships.
- **Representation gaps** limit women's presence in high-level negotiations.
- **Fragmentation** of initiatives dilutes collective impact.

Addressing these requires stronger coordination and investment in Africa's STI infrastructure to sustain equitable collaboration.

3.5.2 Emerging Models of Cooperation

Innovations are reshaping engagement. The **African Open Science Platform (AOSP)** (2017) expands open access to data and promotes cross-regional, gender-inclusive collaboration (Motshegwa, 2025). The **Africa–Europe Foundation's Women Leaders Network** (2021) connects female scientists from both continents to influence bi-regional research agendas (Africa–Europe Foundation, 2022). Partnerships under **UNESCO's Open Science Recommendation** and the **AU–EU Innovation Agenda** further promote equitable knowledge exchange and mutual accountability.

3.5.3 Implications for Science Diplomacy

By aligning continental priorities with global frameworks, convening transnational networks, and embedding gender equity in cooperation mechanisms, African institutions amplify the continent's influence. Initiatives such as open-data platforms and women's leadership networks prove that collaboration can be both globally impactful and locally inclusive. The next step is ensuring that women and early-career scientists not only participate but also help set international research and policy agendas.

3.6 Conclusion

African institutions form the backbone of inclusive science diplomacy. From academies and professional networks to regional and continental bodies, they mobilise expertise, translate evidence into policy, and negotiate Africa's priorities on the global stage.

Programmes and fellowships cultivate a new generation of leaders; policies and frameworks embed gender equity in governance; and cooperation extends these gains across borders. Together, these pillars illustrate that inclusivity is intentional, not incidental.

The path forward lies in scaling effective programmes, reinforcing policy commitments, and deepening cooperation. Empowering women and early-career scientists will ensure that Africa's science diplomacy remains representative, resilient, and transformative – shaping a global knowledge society grounded in equity and shared progress.

4 VOICES AND CONTRIBUTIONS OF AFRICAN WOMEN SCIENTISTS

4.1 Introduction

African women scientists have been central to advancing science diplomacy across the continent, shaping evidence-informed policies in public health, agriculture, climate resilience, water security, governance, and peacebuilding. Their contributions span all three dimensions of science diplomacy—science in diplomacy, diplomacy for science, and science for diplomacy (The African Academy of Sciences, 2024), demonstrating their pivotal role in bridging scientific knowledge and policy action at national, regional, and global levels.

To illustrate the breadth and depth of this leadership, the chapter is structured in two complementary parts. The first presents three in-depth case studies – Dr. Matshidiso Moeti, Dr. Segenet Kelemu, and H.E. Ellen Johnson Sirleaf – whose trajectories offer rich insights into transformational leadership in public health systems, agricultural innovation, and evidence-informed governance. These analyses explore their achievements, the challenges they navigated, and the lessons they offer for strengthening inclusive science diplomacy.

The second part broadens the lens to highlight other influential African women scientists whose work across health, environment, and biotechnology continues to inform policy and drive scientific progress. It also includes a thematic case study from the Democratic Republic of Congo, demonstrating how women scientists have contributed to science diplomacy and institution-building in post-conflict contexts, even when individual leaders cannot be publicly named. Together, these examples underscore the wide-ranging impact of African women in shaping the continent's science diplomacy landscape.

4.2 Amplifying the Voices and Contributions of Women Scientists in Africa and Science Policy

This section highlights three case studies that showcase how African women scientists have applied their knowledge and expertise to impact science-based policy and diplomacy. Each case study represents a distinct contribution to addressing critical challenges facing the continent, ranging from:

- Crisis response: war, health, and resource challenges,
- Innovations in climate change adaptation and sustainability, and
- Women leading peacebuilding and reconstruction efforts.

These examples not only underscore the transformative impact of individual women leaders but also highlight the importance of implementing the support that will contribute to nurturing inclusive and science-driven leadership in Africa with an impact on the economic, social, and environmental development of the continent.

4.2.1 Dr. Matshidiso Moeti's Transformational Role in Responding to HIV and H1N1 (Botswana)

Dr. Matshidiso Moeti was appointed as the first woman to serve as the WHO Regional Director for Africa in 2015. This appointment marked a landmark achievement in the continent's health governance, and her contributions have spanned a "decade of transformation 2015–2024" – dedicated to "Improving the health of the people of Africa" (World Health Organisation, 2024). Her tenure was shaped by major public health crises across the African continent, including the Ebola outbreak in West Africa, the HIV/AIDS epidemic, and the COVID-19 pandemic, all of which called for more resilient, responsive, and effective policies.

This case study focuses on two key areas where Dr. Moeti's expertise and leadership demonstrated effective science diplomacy: addressing HIV/AIDS and strengthening pandemic preparedness, particularly regarding H1N1 influenza.

HIV/AIDS: Strengthening Prevention, Treatment, and Governance

Expansion of Antiretroviral Therapy (ART)

Through Dr. Moeti's leadership in WHO Africa, the number of people receiving ART in Africa doubled between 2010–2023 (refer to Figure 1), increasing from 10.5 million to over 21.3 million (World Health Organisation, 2024). This significant scale-up contributed to substantial reductions in AIDS-related mortality and new infections.

Figure 1 below illustrates the growth in ART coverage across the WHO African Region.

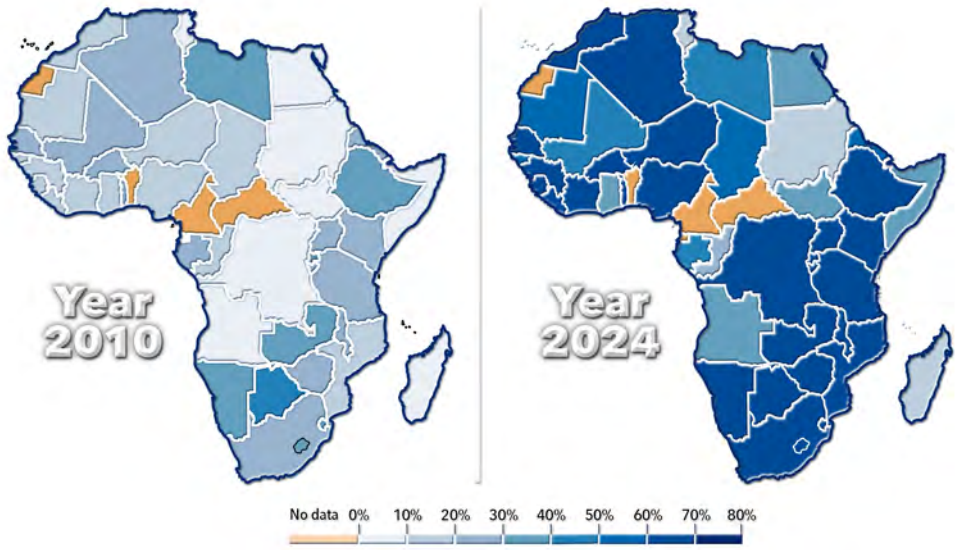

***FIGURE 1.** Growth in ART Coverage in the WHO African Region (2010–2024)*
[Share of the population living with HIV receiving antiretroviral therapy, 2010–2024 – share of individuals diagnosed with HIV who are currently receiving antiretroviral therapy (ART)]
(Source: Rose and Ritchie, 2023 | Adapted by Scinnovent Centre)

Achieving Global HIV Targets

By late 2024, seven African countries had met the UNAIDS 95-95-95 targets (UNAIDS, 2024),

- 95% of people living with HIV/AIDS are aware of their status,
- 95% of people diagnosed with HIV/AIDS had received sustained ART, and
- 95% of people on ART had achieved viral suppression.

Elimination of Mother-to-Child Transmission (PMTCT)

Eastern and Southern Africa reported that 90% of pregnant women living with HIV were receiving ART to prevent mother-to-child transmission, reflecting strong integration of antenatal care and treatment services (World Health Organisation Regional Office for Africa, 2024).

Rights-Based and Community-Led Approaches

Dr. Moeti championed community engagement and rights-based programming, recognising that stigma, gender inequality, and discrimination remain significant barriers to HIV service access. Her policies emphasised empowering community health workers and promoting gender equity (Obokoh, 2024).

HIV Response During COVID-19

Despite disruptions caused by the COVID-19 pandemic, WHO Africa implemented adaptive service delivery models under Dr. Moeti's leadership – such as multi-month ART dispensing – to maintain continuity of care (World Health Organisation, 2024). Table 1 summarises key HIV-related achievements during her tenure.

Table 1. HIV Progress in the WHO African Region (2015–2024)

Indicator	2015	2024	± Increase
People on ART[1] (x 10^6)	10.5	21.3	2.03 x
Number of countries reaching 95–95–95 targets	0	7	-
PMTCT[2] coverage among pregnant women (%)	65	90	1.38 x
AIDS-related deaths (x 10^6/ yr)	1.1	0.43	0.39 x
ART[1] - Antiretroviral Therapy; PMTCT[2] – Prevention of Mother-To-Child Transmission			

Source: UNAIDS, 2024; World Health Organisation Regional Office for Africa, 2024

H1N1 and Influenza Preparedness: Strengthening Early Warning Systems

While the region did not experience a major H1N1 outbreak during Dr. Moeti's tenure, her leadership was instrumental in bolstering Africa's preparedness for influenza-like pandemics.

The key contributions under her tenure include:

- **Surveillance System Upgrades:** Expansion of surveillance capacity for influenza-like illness (ILI) and severe acute respiratory infections (SARI) in over 40 countries (World Health Organisation, 2024).

- **Enhanced Laboratory Networks:** Improvements in real-time testing capabilities for respiratory pathogens, including H1N1 and COVID-19 (World Health Organisation, 2024).
- **Rapid Response Mechanisms:** Establishment of emergency operations centres, country-level outbreak response teams, and cross-border coordination frameworks (World Health Organisation, 2024).
- **Regional Partnerships and Science Diplomacy:** Collaboration with entities such as the Africa Centres for Disease Control and Prevention, the Global Alliance for Vaccines and Immunization (GAVI, and national ministries to facilitate data-sharing, vaccine stockpiling, and diagnostic preparedness (World Health Organisation, 2024).

Impact and Lessons for Science Diplomacy in Africa

Dr. Matshidiso Moeti's tenure (2015–2024) exemplifies the transformative potential of science diplomacy in advancing public health in Africa (World Health Organisation, 2024). She integrated evidence-based strategies, informed by strong science, with regional collaboration and inclusive governance. This is a very good example of the dimension of science policy focused on diplomacy for science. This approach contributed to significantly improving HIV treatment coverage, improved preparedness plan to address public health pandemics, thus contributing to building resilient health systems, and "Improving the Health of the People of Africa", and achieving SDG 3 – Good Health and Well-Being "to ensure healthy lives and promote well-being for all at all ages" (United Nations, 2025).

The leadership of Dr. Matshidiso Moeti also underscores the crucial importance of the role of women in science diplomacy. As the first African woman to lead the WHO African Region, she prioritised community engagement and gender-responsive policies. This approach has had a positive impact on the health systems on the continent.

4.2.2 Dr. Segenet Kelemu's Leadership in Sustainable Agriculture and Climate Resilience (Ethiopia)

Dr. Segenet Kelemu, an Ethiopian scientist, is the fourth Director General and the first woman to lead the International Centre of Insect Physiology and Ecology (ICIPE) (Nairobi, Kenya) from 2013 to 2023. By training, she is a molecular plant pathologist. Through her leadership and expertise, she has pioneered and advanced agricultural science and innovation across Africa. Her leadership is an example of science diplomacy, whereby she has used science diplomacy to harness local innovation and international collaboration to address Africa's challenges of food insecurity, biodiversity loss, and climate change.

Key Scientific Contributions: Integrated Pest Management (IPM) and the Insect-based Solutions for Food and Feed (INSEFF) Programmes and Science Diplomacy

Dr. Kelemu and her team at ICIPE contributed to the transformation of the institution into a Centre of Excellence for integrated and sustainable agricultural solutions, driven by high-quality research. Her strategic vision emphasised the role of insect science not only in crop and livestock protection but also as a pathway toward environmental sustainability and nutritional resilience in Africa – knowledge creation and solution of problems for Africa by Africans (Wanjiru and Iheka, 2023).

The most significant contribution of Dr. Kelemu was the increased adoption of IPM programmes, as an environmentally friendly approach, across sub-Saharan Africa, and shaped the development and adoption of biological control methods. The key strategies include the introduction of natural pest enemies like parasitoid wasps, predatory insects, and the impact of climate-related pest outbreaks, including outbreaks of fall armyworm infestations and desert locust invasions. These natural methods of control have substantially benefited smallholder farmers by reducing their dependence on heavy use of chemical pesticides and improving environmental stewardship (Ediagbonya *et al*., 2025). The scientific knowledge created at the ICIPE has contributed to achieving SDG 2 – Zero Hunger and SDG 13 – Climate Action of the United Nations (United Nations, 2025).

ICIPE, under the leadership of Dr. Kelemu, also pioneered the INSEFF Programme. The mission of INSEFF is to strengthen food and feed security and improve the economic well-being of smallholder farmers through sustainable, environmentally friendly insect-based technologies and innovations. This is pursued by developing, disseminating, and promoting insect-based solutions for food, feed, and other applications, thereby enhancing productivity, value addition, and the overall competitiveness of the agricultural sector to support improved livelihoods. This initiative aims at promoting sustainable insect farming as a sustainable solution to food insecurity in Africa, specifically protein insecurity. Trials have been run on many insect species, in particular the Black Soldier Fly (BSF) larvae and crickets. Many programmes driven by innovative research have been successfully implemented and address directly the problems facing the continent, as shown in Table 2, with significant impact on enhanced food security, greener agricultural practices, improved livelihoods, and the formulation of science-based policies focused on guidelines for ensuring the microbial safety of insect-based products. The programmes have also fostered collaborations with international and regional collaborators and stakeholders, including the Netherlands Organisation for Scientific Research (NWO), International Development Research Centre (IDRC), the Australian Centre for International Agricultural Research (ACIAR), and universities (Wageningen University, Egerton University, University of Nairobi, Makerere University).

Moreover, Dr. Kelemu elevated ICIPE's role in the regional science-policy dialogue. Through strategic partnerships with the African Union, the African Development Bank, and national governments, ICIPE has influenced evidence-based policies on agricultural biodiversity, food systems, and climate adaptation. Her model of science diplomacy effectively bridges international research with local implementation, ensuring that innovations are both relevant to regional contexts and scalable across diverse ecosystems, and to inform policies for the promotion of safe, sustainable, and cost-effective use of insects in the feed sector (AUDA-NEPAD, 2021).

Lessons for Science Diplomacy in Africa

Dr. Kelemu's leadership provides valuable insights into how science diplomacy can promote sustainable and green agricultural development, with an impact on policy formulation for a greener agriculture and

enhanced food and nutrition security, and improved livelihoods in Africa. The career of Dr. Segenet Kelemu shows how African science leaders can redefine the continent's agricultural future through innovation, diplomacy, and inclusivity.

4.2.3 H.E. Ellen Johnson Sirleaf Impactful Peacebuilding Through Women's Leadership (Liberia)

H.E. Ellen Johnson Sirleaf is the first elected female head of state and President of Liberia from 2006 to 2018. She is recognised for her leadership in addressing post-conflict recovery, strengthening democratic governance, and promoting women's empowerment. International recognition won her the Nobel Peace Prize in 2011. The leadership of H.E. Sirleaf was marked by the initiatives to promote science-informed diplomacy and the integration of science to address issues of public health, education, and gender-inclusive governance into Liberia's long-term peacebuilding process.

Science-Driven Leadership for Peacebuilding in a Post-Conflict Recovery State

During her presidency, H.E. Sirleaf focused on peacebuilding and adopted an evidence-based, interdisciplinary approach, using socioeconomic data, health metrics, and institutional assessments to guide the recovery efforts in her country (Badaru and Adu, 2024). In doing so, she not only focused on military disarmament but also used science to strengthen her priority efforts to strengthen public health, education, and governance systems as the foundational elements of sustainable peace in her country. Rather than focusing exclusively on military disarmament or top-down reconciliation, her administration prioritised strengthening public health, education, and governance systems as foundational elements for sustainable peace (Truth and Reconciliation Commission of Liberia, 2009).

During her tenure as President, she reformed and revitalized Liberia's health system, particularly in a country that was hardly hit by the 2014–2016 Ebola epidemic. She collaborated closely with the WHO, Centres for Disease Control and Prevention, and the African Union to enhance disease

surveillance, rebuild healthcare facilities, and train medical personnel in her country. These investments established a framework for enhanced preparedness during subsequent health crises, including the COVID-19 pandemic.

Her work illustrates the links between science and its impact on science diplomacy and national security. Community-level engagement, particularly involving women and youth, was central to rebuilding social trust. President Sirleaf championed data-driven public health campaigns and empowered women-led community networks to disseminate health information and mediate local conflicts. This grassroots engagement exemplifies the practice of science diplomacy at the national level — employing scientifically grounded policies to foster social and political stability.

Lessons for Science Diplomacy in Africa

The presidency of H.E. Sirleaf offers lessons on how inclusive, evidence-based leadership can stabilise countries in times of conflict and war. Her integration of science and governance -particularly through investments in health and education system reconstruction - illustrates the critical role of science diplomacy in peacebuilding. H.E. Ellen Johnson Sirleaf's legacy serves as a blueprint for post-conflict recovery grounded in gender equity, scientific rigour, and diplomatic engagement.

4.3 Leadership Spotlights

This section narrates the profiles of trailblazing women in different African countries and regions, including Cameroon, Kenya, Sudan, South Africa, and the Republic of Mauritius. Additionally, it highlights the achievement of these women and their significant contributions to science diplomacy. Through their leadership and research, they have addressed critical challenges facing the African continent and have influenced policies, fostering international cooperation in areas spanning from public health, climate change, and sustainable agriculture. In closing, this chapter also highlights women scientists' contributions to peace in the DRC as a case for crisis response.

4.3.1 Prof. Rose Gana Fomban Leke – Professor of Immunology (Cameroon)

Prof. Rose Gana Fomban Leke is an eminent immunologist whose research has had a profound impact on studies conducted on malaria. Her research work has informed science-based health policy in Africa. Prof. Leke is based at the University of Yaoundé (Cameroon). Her research, and that of her team, has advanced the understanding of malaria immunity. The research work focused on vulnerable populations, namely pregnant women and children. Prof. Leke has served as President of the African Society for Immunodeficiencies and, in that capacity, played a key role in driving health policies for the African continent in her advisory positions with the WHO and the AU (Africa News Agency, 2024). Her leadership provides a strong example of the synergy between scientific expertise and diplomacy, advocating for increased investment and capacity building in African research institutions to address region-specific health challenges (African Union, 2022). Prof. Leke's work underscores the indispensable role of women scientists in linking research with policy to improve health outcomes across Africa.

4.3.2 Prof. Wangari Maathai – Nobel Laureate (Kenya)

The first African woman to win the Nobel Peace Prize was Prof. Wangari Maathai (1940–2011) (The Nobel Prize, 2004). She was a pioneering champion of sustainable development and a dedicated environmentalist. She championed the "Green Belt Movement" and mobilised communities to plant millions of trees across Kenya. This initiative contributed to addressing the problem of deforestation and promoted biodiversity conservation, with a significant impact on environmental stewardship (Environment Next, 2024). Her work focused on connecting environmental stewardship with human rights, democracy, and women's empowerment, influencing environmental policy at the regional and international levels (Environment Next, 2024). Prof. Maathai worked as Assistant Minister for Environment and Natural Resources in Kenya (Green

Belt Movement, 2024). During her tenure, she strongly advocated for science-based climate resilience policies. Her legacy remains foundational to environmental diplomacy in Africa. This illustrates how science and science diplomacy have an enduring impact on sustainable development. Dr. Maathai's achievements continue to inspire generations of African women to engage in science and diplomacy to confront climate and environmental challenges.

4.3.3 Dr. Balgis Osman-Elasha – Climate Scientist and IPCC Contributor (Sudan)

Dr. Balgis Osman-Elasha is a distinguished climate scientist from Sudan. She specialised in the impacts of climate change and adaptation strategies within Africa and is a lead author for multiple Intergovernmental Panel on Climate Change (IPCC) assessment reports. Her work has contributed to enhancing the voice of Africa and sharing the African perspectives within the global climate dialogue, emphasising the continent's vulnerabilities and resilience mechanisms (Intergovernmental Panel on Climate Change, 2007). Dr. Osman-Elasha has collaborated extensively with the UN Framework Convention on Climate Change (UNFCCC) and the African regional bodies to develop policies that integrate scientific insights with the community needs and realities (African Development Bank, 2021). She is a strong advocate for gender-sensitive climate adaptation programmes and champions the essential role of women in sharing their indigenous knowledge in fostering climate resilience. Her contributions illustrate the intersection of science, policy, and diplomacy in the context of addressing bold climate action for Africa.

4.3.4 Prof. Lindiwe Majele Sibanda – Chair, CGIAR Integrated Partnership Board (South Africa)

Prof. Lindiwe Majele Sibanda has built a remarkable career contributing to science, policy, and practice. An animal scientist and practising farmer, she has consistently used her knowledge to influence agricultural research and policies that shape food security and climate resilience in Africa and beyond. Her leadership spans many institutions. As CEO of the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), she transformed the organisation into a respected platform that bridged evidence from science with policy decisions, amplifying the voices of farmers, especially women and smallholders. She has also served as Vice-President at AGRA, co-Chair of the Global Alliance for Climate-Smart Agriculture and contributed to the influential EAT-Lancet Commission on healthy diets. Prof. Sibanda has played strategic roles on the boards of leading research institutions, including ILRI and IFPRI, where she championed integrated solutions to agriculture, climate change, and nutrition. Today, as Chair of the CGIAR Integrated Partnership Board (CGIAR, 2023), she guides global research efforts to transform food, land, and water systems under climate change. Her remarkable career demonstrates how science can be a powerful tool for shaping inclusive policies, ensuring that research translates into real benefits for communities and the environment.

4.3.5 Dr. Asha Dookun-Saumtally – Plant Biotechnologist (Mauritius)

Dr. Asha Dookun-Saumtally is a leading plant biotechnologist from the Republic of Mauritius. Her research work has focused on innovative biotechnological approaches to advance food security in Africa. Her research focuses on biotechnological approaches to enhance crop resistance and productivity in the face of climate change challenges. She has been instrumental in regional efforts to promote biotechnology governance and biosafety frameworks, fostering scientific collaboration

across African countries. She has supported decision-making with robust scientific evidence and contributed to policies that have been instrumental across health, agriculture, environmental sustainability, and peacebuildin.

4.3.6 Prof. Rajaâ Cherkaoui El Moursli – Bridging Nuclear Science and Public Health (Morocco)

Prof. Rajaâ Cherkaoui El Moursli has been a pioneer in linking nuclear science with public health in Morocco and across Africa. Recognising the need for trained medical physicists, she led the establishment of Morocco's first Master's Programme in Medical Physics (2007–2009) at Mohammed V University, which has since produced specialists ensuring the safe use of ionizing radiation in hospitals nationwide. Their work has strengthened cancer treatment, improved diagnostic imaging, and enhanced radiological safety.

Through collaborations with the International Atomic Energy Agency (IAEA) and participation in CERN's ATLAS experiment, Prof. El Moursli has advanced knowledge transfer and aligned national practices with global safety standards, turning scientific cooperation into a tool of diplomacy.

She serves on several national bodies, including the Moroccan Agency for Nuclear and Radiological Safety (AMSSNuR) and the National Centre for Nuclear Energy, Science and Technology (CNESTEN), where she advises on radiation protection, nuclear security, and energy policy. As a member of Women in Nuclear (WiN) Morocco and WiN Africa, she also mentors and connects women in nuclear science and safety across the continent.

Prof. El Moursli's leadership exemplifies how women scientists act as both researchers and diplomats—advancing technology, shaping policy, and building trust between science and society. Her career demonstrates that empowering women in medical physics is not only a step toward gender equality but also a strategic investment in Africa's health security and international cooperation.

4.4 Crisis Response: Women Scientists in Conflict-Affected Eastern Democratic Republic of Congo

The Democratic Republic of Congo (DRC) has endured decades of protracted conflict, particularly in its eastern regions, where cycles of armed violence, mass displacement, and fragile governance intersect with recurring public health and resource crises (Stearns, 2021). More than 6.9 million people are currently internally displaced, many of them women and children (UNHCR, 2024). Armed actors such as the M23, the Allied Democratic Forces (ADF), and various Mai-Mai groups, alongside the Armed Forces of the Democratic Republic of the Congo (FARDC)-Wazalendo coalitions and regional forces, shape a highly insecure environment (International Crisis Group, 2025). Against this backdrop, Congolese women scientists have emerged as critical actors, leveraging their expertise to address urgent humanitarian needs while navigating systemic gender and institutional barriers. Their contributions highlight the nexus between science, diplomacy, and peacebuilding in fragile contexts.

4.4.1 Women Scientists in Peacebuilding and Reconstruction

The role of Congolese women scientists extends into peacebuilding. Drawing on their credibility as professionals and their experience in community engagement, they serve as intermediaries between local populations, armed actors, and international agencies. Women health professionals, for example, advocated for the protection of hospitals and delivery of essential medicines during negotiations on humanitarian corridors in Ituri (Ekota *et al*., 2024). Women scientists are also active in transitional justice and reconciliation processes, documenting conflict-related sexual violence and environmental crimes. At the same time, women-led research centers in eastern DRC universities, including Université Catholique de Bukavu and Université Officielle de Bukavu, focus on health, environment, and peace studies. These spaces provide training for early-career researchers, promote interdisciplinary collaboration, and produce policy briefs that inform government and NGO programming (Tripp *et al*., 2025).

4.4.2 Health Crises and War: Women Scientists on the Frontlines

The eastern provinces of North Kivu and Ituri have been the epicentre of recurrent Ebola outbreaks and, more recently, COVID-19, cholera, and measles emergencies — aggravated by ongoing armed conflict (WHO, 2020). Women scientists — including epidemiologists, medical researchers, and public health practitioners — played indispensable roles in surveillance, community engagement, and culturally sensitive interventions. For instance, Congolese epidemiologists championed community-based surveillance systems that integrated local women as health promoters, enabling rapid reporting of suspected cases even in insecure areas (Okeeffe *et al*., 2023). In contexts where mistrust of authorities hindered disease control, women scientists used their social legitimacy and diplomatic acumen to mediate between health responders, traditional leaders, and vulnerable communities. By prioritizing culturally resonant communication strategies — such as incorporating local languages, women's associations, and faith-based networks — Congolese women scientists helped reduce resistance to vaccination campaigns and improved health-seeking behavior (Vinck *et al*., 2019).

Equally important, women scientists engaged in science diplomacy by liaising with the World Health Organization (WHO), African Centres for Disease Control and Prevention (CDC), and United Nations Organisation Stabilization Mission in the DRC MONUSCO, bridging gaps between international responders and conflict-affected communities (Nkengasong *et al*., 2021). Their dual role as scientists and intermediaries enhanced trust in outbreak responses.

4.4.3 Resource and Environmental Challenges

Conflict in eastern DRC is fueled by competition over mineral resources. Women scientists trained in natural resource management and environmental health have advanced initiatives for sustainable and transparent governance. Recent studies link artisanal mining to water contamination and reproductive health risks among women living near cobalt extraction sites (RAID, 2024). By documenting these environmental and health impacts, Congolese women scientists and their partners provide evidence for advocacy around stronger governance frameworks

and international negotiations on conflict minerals (Kulkarni, 2024). Their engagement extends to regional and international fora on the responsible sourcing of cobalt and coltan-strategic minerals critical to global energy transitions. As women scientists articulate local perspectives in global platforms, they bridge the gap between affected communities and international policymakers, strengthening the science-policy-diplomacy nexus.

4.4.4 Innovations in Climate Adaptation and Community Resilience

Armed conflict in the DRC coincides with high vulnerability to climate change, particularly regarding food insecurity, disasters, and displacement. Women agronomists and climate scientists have developed adaptive agricultural strategies tailored for displaced populations and war-affected farmers. Techniques such as soil fertility restoration through composting, crop diversification, and small-scale irrigation are promoted by women-led cooperatives (Awotide *et al*., 2025). These innovations mitigate climate risks and strengthen livelihoods in fragile contexts, reducing socio-economic drivers of instability. Women scientists have also contributed to disaster risk reduction efforts following recurrent floods and landslides in South Kivu, such as the 2023 Bushushu and Nyamukubi disasters, where they provided expertise in community risk assessments and early warning systems. Cross-border collaboration with counterparts in Rwanda, Uganda, Burundi, and initiatives like the Nile Basin Initiative demonstrate the role of women scientists in regional science diplomacy around climate resilience (Nile Basin Discourse, 2025).

4.4.5 Barriers and Opportunities

Despite these achievements, Congolese women scientists face structural barriers, including underfunding, security risks, and entrenched gender norms. The militarization of research environments exposes them to harassment and exclusion, while limited institutional support constrains their capacity to scale interventions (Alldén, 2025). Most funding still bypasses local women scientists, being channeled through international partners. Yet, there are emerging opportunities: mentorship networks such as Congolese Women in Science initiatives, African Women in Agricultural

Research and Development, and growing support from regional bodies like NASAC. Scaling funding for women-led initiatives, integrating gender in science diplomacy strategies, and building regional platforms for women scientists are urgent steps to amplify their impact.

4.4.6 Lessons for Science Diplomacy in Africa

The case of women scientists in eastern DRC underscores that science diplomacy in Africa is not confined to formal negotiations among states. It also unfolds in everyday practices where women researchers mobilize knowledge to address crises, mediate across social divides, and promote inclusive reconstruction. Their work demonstrates that advancing the role of African women scientists is not only a matter of equity but also a strategic imperative for building peace and resilience in fragile states.

4.5 Conclusion

This chapter has focused on the remarkable contributions of African women scientists in advancing the three dimensions of science diplomacy: *diplomacy for science, science for diplomacy, and science in diplomacy*. Through their scientific expertise, leadership, and advocacy, these women have supported decision-making with robust scientific evidence and contributed to policies that have been instrumental across health, agriculture, environmental sustainability, and peacebuilding. The profiles presented illustrate the resilient strategies adopted by the women scientists to engage in high-quality research, to engage with the community and foster regional and international collaborations to impact on science-based policy and address the needs of the people of Africa. Their leadership and contributions have enriched science diplomacy.

Looking forward, the Academies of Science in Africa have a critical role in institutionalising gender-sensitive frameworks that empower women scientists as agents of change within science diplomacy. Academies should prioritise and advocate for increased access to resources, leadership development, and networking opportunities for women. Additionally, by fostering interdisciplinary collaborations and strengthening partnerships with governments, international organisations, and civil society, the Academies can enhance the integration of scientific knowledge into

diplomacy and policymaking processes. This approach will contribute to sustainable development, peace, and regional cooperation in Africa. Continued support and recognition of these trailblazing women by the scientific community, policymakers, and diplomatic actors will be crucial for Africa's transformation in the decades to come.

5 POLICY PATHWAYS FOR INCLUSIVE SCIENCE DIPLOMACY

5.1 Introduction

This chapter proposes a strategic framework for advancing inclusive science diplomacy in Africa in times of crisis. It identifies five interlinked policy pathways: strengthening representation and visibility, expanding networks and mentorship, enhancing capacity development, deepening institutional and policy integration, and establishing recognition and reward systems. Together, these pathways aim to institutionalise gender-responsive approaches, broaden leadership opportunities, reinforce communities of practice, and embed science diplomacy within education, governance, and diplomatic training. Advancing women's participation in science diplomacy is essential not only for promoting gender equality but also for ensuring that Africa responds to global health, climate, and peace challenges with a balanced and inclusive voice.

5.2 Policy Pathway 1: Representation and Visibility

African women remain significantly underrepresented in science diplomacy and STEM leadership due to structural, cultural, and institutional barriers. Persistent stereotypes continue to cast men as public leaders and innovators while positioning women in private, nurturing roles (Science for Africa Foundation, 2024). These biases are especially acute for women from marginalised groups, including those from indigenous, low-income, and rural communities.

To address these disparities, policy actions must deliberately strengthen women's participation across scientific and diplomatic institutions. This includes enforcing gender quotas in diplomatic

and scientific bodies to ensure parity in delegations to global platforms such as the UN General Assembly, WHO, and COP summits; mandating the presence of women scientists in national science advisory councils, research boards, and foreign affairs committees; and integrating gender provisions into national and continental charters, drawing on guidance from organisations such as the ISC and WHO to embed equitable participation across governance structures.

Encouraging progress is emerging. The appointment of Prof. Josephine Ngaira to the World Climate Research Programme Joint Scientific Committee (2024) and the increased visibility of networks such as the African Women in Science and Engineering (AWSE) demonstrate a growing recognition of women's contributions and preparation for diplomatic engagement. UNESCO's Gender Equality Strategy in STI further mainstreams gender across global science platforms, connecting African women to international policy dialogues (UNESCO, 2025).

Ultimately, representation requires both institutional commitment and collective advocacy. Establishing a Pan-African Consortium of Science Women Diplomats could amplify women's voices globally and help ensure that research agendas reflect African contexts and priorities. Greater visibility not only inspires future generations but also affirms that women's leadership is central – rather than peripheral – to scientific advancement and effective diplomacy.

5.3 Policy Pathway 2: Networks and Mentorship

Mentorship and professional networks are proven accelerators of women's advancement in science diplomacy. They provide technical guidance, leadership coaching, and moral support (refer to *Figure 2*) that sustain women's participation in competitive fields (Stofer, 2024).

Policy priorities should centre on strengthening structured mentorship and collaboration among women scientists at all career stages. This includes expanding institutional mentorship programmes that pair senior and early-career researchers, supporting transnational initiatives such as the PEER Women in Science Programme (implemented with WIOMSA) that connects senior and junior scientists across Sub-Saharan

Africa, and enhancing platforms like NASAC's Women for Science (WfS) Working Group, which promotes gender integration and collaboration among national academies. Governments and development partners can further reinforce these efforts by investing in regional forums – such as COMSTEDA and the UNESCO/AU STEM conferences – that provide spaces for mentorship, networking, and cross-country learning.

Figure 2: Mentoring connects factors such as motivation, coaching, and support
Source: Stofer (2024)

Examples of progress are visible across the continent. Prof. Priscilla Baker, the 2025 L'Oréal–UNESCO laureate, has been recognised for her pioneering work in analytical chemistry, while Dr. Ruth Lorivi Moirana received the 2024 Young Talent Award for her contributions to scientific research. Prof. Francine Ntoumi, founder of the Congolese Foundation for Medical Research, is widely acknowledged for mentoring women in health diplomacy (Thompson-Gorry and Welterlin, 2023). Other distinguished African laureates of the L'Oréal–UNESCO for Women in Science Award – such as Prof. Tebello Nyokong of South Africa for her groundbreaking work in nanotechnology and photodynamic cancer therapy, Prof. Rose Leke of Cameroon for her leadership in malaria research and mentorship. Such recognitions demonstrate how women's excellence and mentorship continue to strengthen Africa's voice in global science diplomacy.

African women scientists should also be encouraged to join global and continental professional networks, including Women in Science Without Borders (WISWB), the Sister-to-Sister Young Feminist Leadership

Programme, and African Women in Science (AWIS). By linking women scientists across regions and disciplines, these networks create a multiplier effect: mentorship expands professional networks, networks foster collaboration, and collaboration enhances Africa's engagement in international science and policy spaces.

5.4 Policy Pathway 3: Capacity Development

Expanding women's participation in science diplomacy begins with education, training, and exposure. Strengthening the pipeline from STEM education to diplomatic leadership is both a gender and development imperative. Key policy directions therefore, include expanding STEM education for girls, particularly through secondary schools with strong science programmes and scholarships in underserved regions, while integrating science diplomacy training into university curricula in diplomacy, international relations, and STEM faculties. Capacity development should also involve establishing specialised training institutes for women scientists in negotiation, communication, and policy engagement, supported by ministries of foreign affairs, national academies, and regional bodies. Postgraduate training institutions such as AIMS, OWSD, TWAS, and the AAAS–TWAS science diplomacy programmes continue to play a central role by equipping scientists for policy and leadership roles, and AU-led fellowship schemes offering mobility grants for women in health, climate, and peace diplomacy would further strengthen this pipeline.

Education and training reforms should align with global frameworks that advance gender-responsive governance. The Beijing Platform for Action (1995) and CEDAW (1979) provide strong normative foundations for gender equality in education and decision-making, while the Sustainable Development Goals (SDGs), particularly SDG 4 on quality education and SDG 5 on gender equality, offer measurable benchmarks for national STI systems. Countries such as Kenya, through the Competency-Based Curriculum, and South Africa, through recent higher education reforms, have begun operationalising these commitments within their national contexts.

At the continental level, the African Union Peace and Security Council (2025) reinforced these priorities by committing to appoint a Special

Envoy on Women, Peace, and Security, by supporting the establishment of the African Women Leaders Network (AWLN), and by setting a 30 percent gender quota in peace and diplomacy processes. Taken together, these frameworks underscore that education, training, and leadership development are inseparable pillars of inclusive science diplomacy.

5.5 Policy Pathway 4: Institutional and Policy Integration

Institutionalizing women's participation in science diplomacy requires systemic reform and stronger policy coherence. Although frameworks such as Agenda 2063 and STISA-2034 provide solid foundations, implementation gaps persist across many countries due to fragmented mandates, uneven coordination, and limited funding. Addressing these gaps demands deliberate policy measures that embed gender equity across all STI, foreign affairs, and education policies at both national and regional levels. This includes creating national science diplomacy units within foreign ministries equipped with gender advisors, as well as establishing a Pan-African Observatory on Women in Science Diplomacy to collect data, monitor progress, and share best practices. Greater harmonisation of policies across Regional Economic Communities – such as SADC, ECOWAS, and the EAC – would also help standardise gender reporting and strengthen accountability mechanisms.

Partnerships with institutions such as NASAC, AUDA-NEPAD, and UNESCO can support the development of a continental scorecard to track women's representation in diplomacy, negotiation, and scientific leadership. At the national level, governments and universities should collaborate to develop gender-inclusive science diplomacy curricula and create incentives for women's participation through grants, leadership opportunities, and institutional reforms. Ensuring that women scientists are integrated into advisory roles for bodies such as the Africa CDC, COMESA, and AfCFTA will further enhance Africa's collective influence in science-driven policymaking and strengthen the continent's position in global negotiation.

5.6 Policy Pathway 5: Recognition and Reward Systems

Recognition legitimises women's contributions and inspires future participation, yet the accomplishments of African women scientists — whether in formal diplomacy or community-driven innovation — often remain overlooked. Strengthening recognition, therefore, requires institutionalising national and continental awards for women in science diplomacy, building on models such as the South African Women in Science Awards (SAWiSA). It also involves creating a continental directory of women science diplomats that governments and multilateral agencies can draw upon and expanding visibility efforts through initiatives like the UN International Day of Women and Girls in Science to highlight role models across the continent. Equally important is providing targeted funding for women-led initiatives in renewable energy, climate action, and peacebuilding, including programmes such as SHE–Solar Entrepreneurs in Sierra Leone (GEAPP, 2023), which demonstrate how women's leadership drives sustainable development.

African-led platforms such as WiSDA, AWARD, and AWIDIA illustrate how recognition and capacity-building reinforce one another. Through awards, fellowships, and leadership opportunities, these initiatives enhance visibility, credibility, and continuity for women leaders who are shaping Africa's science diplomacy landscape.

5.7 Conclusion

Inclusive science diplomacy cannot thrive without structural reforms that promote representation, mentorship, capacity, institutionalisation, and recognition. These five policy pathways provide a holistic roadmap for embedding gender equity within Africa's scientific and diplomatic systems.

By implementing these measures—supported by continental frameworks, donor partnerships, and national commitment—Africa can cultivate a generation of women science diplomats equipped to negotiate, innovate, and lead. Their inclusion will not only bridge gender gaps but also strengthen Africa's global voice in shaping solutions to health, climate, and security challenges, ensuring that the continent's progress is both **scientifically grounded** and **socially inclusive.**

6 CONCLUSION – A CALL TO ACTION

The preceding chapters have demonstrated that science diplomacy in Africa is both an achievable vision and a strategic necessity, particularly for tackling global crises such as climate change through international collaboration and evidence-based solutions. Through case studies, profiles, institutional analyses, and policy frameworks, this report highlights the growing contributions of African women scientists who are transforming science-policy interfaces across the continent, even in times of crisis. Their leadership, however, continues to unfold within systems that remain uneven, underfunded, and insufficiently inclusive. This final chapter synthesises the insights gathered throughout the study and outlines a collective agenda for accelerating progress. It calls upon governments, scientific institutions, regional bodies, and global partners to convert commitment into action, ensuring that women's participation in science and diplomacy is not peripheral, but central to Africa's resilience in the face of crises, and to the continent's pursuit of sustainable development, peace, and global influence.

6.1 Towards an Inclusive Future for Science Diplomacy in Africa

Africa stands at a defining moment. The continent's scientific capacity, diplomatic engagement, and developmental aspirations are converging in unprecedented ways. At the heart of this convergence lies a critical truth: science diplomacy that excludes women is incomplete. Across the chapters of this report, the evidence is clear: African women scientists are not only advancing discovery but also reshaping how science informs diplomacy, governance, and peacebuilding. From climate change and food insecurity to health emergencies and insecurity, and from higher education to conflict transformation, women's leadership

is redefining what inclusive science diplomacy looks like in practice. Yet, the persistence of systemic inequalities — limited representation, funding disparities, and institutional bias — continues to constrain the full expression of their potential. Africa's next frontier, therefore, demands not incremental improvement, but structural transformation. Inclusion must move beyond rhetoric into measurable, enforceable, and resourced policy action.

6.2 Key Reflections from the Study

- **Representation matters, but influence is the goal**
  Visibility of women in scientific and diplomatic spaces must translate into decision-making power. Inclusion must be intentional, anchored in quotas, targeted appointments, and equitable access to negotiation tables.
- **Institutions are the levers of change**
  From academies and regional economic communities to universities and ministries, institutions give permanence to inclusive practice. When gender equity is embedded in policy, budgeting, and accountability systems, transformation becomes irreversible.
- **Mentorship and networks multiply impact**
  The growth of communities of practice such as NASAC's *Women for Science Working Group*, OWSD Fellowships, and INGSA-Africa Labs shows that mentorship is not peripheral — it is policy. Networks convert individual success into collective advancement.
- **Education and training build pipelines of leadership**
  Expanding access to STEM education for girls and integrating science diplomacy into tertiary curricula are investments in Africa's future negotiators, innovators, and peacebuilders.
- **Recognition sustains momentum**
  Visibility, awards, and leadership opportunities legitimise women's authority in spaces where they have historically been overlooked. Recognition is not symbolic — it shapes culture and expectation.

6.3 A Framework for Action

To translate these insights into practice, **governments, institutions, and partners** must act along five complementary fronts:

- **Policy Commitment**
  Integrate gender equity into all science, technology, innovation (STI), and foreign policy frameworks, ensuring alignment with *Agenda 2063, STISA-2034*, and the *Beijing Platform for Action*.
- **Resource Allocation**
  Establish gender-responsive budgeting across STI programmes and dedicate funding lines for women-led research, leadership training, and participation in global negotiations.
- **Institutional Accountability**
  Mandate gender audits and periodic reporting within academies, ministries, and regional bodies to measure progress toward parity in representation and leadership.
- **Education and Capacity Building**
  Support national and continental programmes that expand STEM education for girls, provide postgraduate fellowships, and integrate science diplomacy modules into curriculaa.
- **Partnership and Recognition**
  Foster collaboration between African and global institutions to spotlight women scientists, celebrate achievements, and share best practices through continental directories, observatories, and annual forums.

These actions require not only commitment but coordination. The African Union, through AUDA-NEPAD and NASAC, are well-placed to convene partners and track progress toward a gender-responsive science diplomacy agenda for Africa.

6.4 The Moral Imperative

Inclusive science diplomacy is not simply a policy preference — it is a moral and developmental imperative. Africa's challenges are complex: pandemics, food insecurity, conflict, and climate shocks transcend borders. Exclusionary solutions will always be incomplete.

Women bring essential perspectives shaped by community engagement, social empathy, and innovation under constraint. When empowered, they redefine the questions asked, the data collected, and the policies implemented. Their leadership strengthens Africa's credibility in global negotiations and ensures that scientific cooperation reflects shared humanity, not hierarchy.

As UN Deputy Secretary-General **Amina Mohammed** aptly said, "*We must all do everything possible to ensure women are at the table, our voices heard, and our contributions valued*." That table must now be Africa's science diplomacy table.

6.5 A Call to Collective Leadership

The call to action is therefore directed at **multiple levels of responsibility:**

- **Governments** must legislate and finance gender equity as a national priority, embedding it in STI and foreign policy.
- **Science academies and universities** must open membership, leadership, and research funding to women equitably.
- **Regional and continental bodies** must harmonise gender frameworks and convene regular reviews of progress.
- **Development partners and donors** must align funding criteria with inclusivity benchmarks, rewarding women-led initiatives.
- **Men in science and diplomacy** must become allies, advocates, and accountability partners for systemic change.
- **Women scientists and diplomats** must continue to lead, mentor, and build alliances that widen access for others.

This is not an agenda for women alone — it is an agenda for Africa's collective transformation. The continent's credibility in global diplomacy will increasingly depend on how well it reflects the diversity and potential of its people.

6.6 Closing Vision: From Inclusion to Influence

The journey toward inclusive science diplomacy is, at its core, a journey toward justice. Each fellowship awarded, each policy reformed, each young woman mentored represents a step toward a continent where knowledge and diplomacy serve all equally.

If Africa can align its scientific excellence with gender equity, it will not only close its representation gap but redefine global standards for fairness, innovation, and cooperation.

The time for incremental change has passed.

What remains is a call to action, to invest, to reform, and to lead with conviction, so that the next generation of African women scientists will not have to claim a seat at the table; they will already be building it.

The Main Message

> ***Inclusive science diplomacy in times of crisis is Africa's pathway to resilience, equity, and influence. Empowering women in science is not an act of charity; it is a strategy for the continent's future.***

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African women scientists are at the forefront of addressing the continent's most pressing challenges, from climate change and health emergencies to food insecurity, conflict, and technological disruptions. African Women Scientists Driving Science Diplomacy in Times of Crisis highlights how their expertise, leadership, and cross-border collaborations are shaping evidence-informed policies and strengthening Africa's voice in global decision-making arenas.

Through rigorous analysis and real-world case examples, the report examines the barriers women face in science and diplomacy, the institutional reforms needed to advance gender-responsive governance, and the transformative role of women-led scientific networks in times of crisis. It offers practical recommendations for policymakers, regional bodies, and scientific institutions to harness the full potential of African women scientists as drivers of innovation, resilience, and sustainable development.

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