

African Science Diplomacy: From Fragmentation to Integration

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Scientists at the lab

In a world constantly changing, and with technology occupying an increasingly important place in our daily lives, science has become one of the motors of economic development, innovation and national competitiveness. Questions are therefore being asked about Africa's agenda when it comes to scientific collaboration and diplomacy. How can a continent of 55 countries, with different languages, research capacities and scientific priorities, collaborate more effectively? And how can Africa move from fragmented scientific partnerships towards a truly continental research ecosystem?

Science diplomacy: an old practice, a relatively new concept

Although scientists have collaborated across borders for centuries, the concept of **science diplomacy** gained greater international recognition in the late 2000s. A major milestone was the 2010 Royal Society and

American Association for the Advancement of Science report *New Frontiers in Science Diplomacy*. It distinguished three dimensions: **science in diplomacy**, where scientific evidence informs foreign policy; **diplomacy for science**, where diplomatic relations facilitate scientific cooperation; and **science for diplomacy**, where scientific collaboration contributes to improving relations between countries (**The Royal Society & American Association for the Advancement of Science [AAAS], 2010, p. 15**).

For Africa, this concept is particularly relevant. Climate change, infectious diseases, food security, energy, water management, artificial intelligence, and biodiversity do not stop at national borders. Yet the scientific systems expected to address these challenges remain largely organised within national boundaries.

Science diplomacy is already entering African foreign policy. At the 2022 World Science Forum in Cape Town, South Africa's then Minister of International Relations and Cooperation, Naledi Pandor, stated:

"We increasingly view science diplomacy as an instrument of our foreign policy" (Pandor, 2022, para. 2).

She also stressed that:

"South Africa, as well as other developing countries, need to forge meaningful global science partnerships" (Pandor, 2022, para. 2). The question for Africa is therefore not whether scientific diplomacy is necessary, but what kind of science diplomacy Africa wants to build.

Africa does not start from scratch

Several initiatives already demonstrate the potential of scientific cooperation across African borders.

The **African Research Universities Alliance (ARUA)** connects research-intensive universities across the continent through collaborative research, postgraduate training and Centres of Excellence. Its model demonstrates that African institutions can pool expertise and develop critical scientific capacity across national borders rather than attempting to reproduce every capability nationally.

A second example is the **Square Kilometre Array (SKA)**. South Africa hosts part of one of the world's largest scientific infrastructure projects, while Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia have participated as African partner countries in associated capacity-building and astronomy initiatives. Beyond astronomy, the project contributes to engineering, computing, data science and scientific training.

A third example comes from health. The **European & Developing Countries Clinical Trials Partnership (EDCTP)** has connected African and European institutions around clinical research on diseases including HIV/AIDS, tuberculosis and malaria. The programme illustrates how interna-

tional cooperation can simultaneously address scientific challenges and strengthen research capacity.

Ugandan physician and HIV/AIDS researcher **Peter Mugenyi** provides a particularly concrete illustration of this approach. Reflecting on international scientific collaboration, he explained:

“We didn’t need to invent the wheel” (Treacy, 2015, para. 31).

For Mugenyi, the fastest way to strengthen African capacity was **“to work in collaboration with other scientists all over the world” (Treacy, 2015, para. 31).**

These initiatives show that collaboration is possible. However, successful individual programmes do not yet constitute a **continental research ecosystem**.

A fragmented scientific landscape

One of the first obstacles is linguistic and institutional fragmentation. Africa’s Anglophone, Francophone, Lusophone and Arabophone academic communities frequently operate within different research networks, publication environments, funding programmes and historical partnerships.

Language diversity is an asset, but it can become a practical obstacle when researchers cannot easily discover, communicate with or follow research conducted elsewhere on the continent. Research on multilingualism and scholarly communication has highlighted how language influences participation in scientific publishing and the circulation of knowledge.

Funding and infrastructure inequalities reinforce this fragmentation. Some African researchers work within internationally connected institutions with advanced laboratories and extensive access to scientific literature, while others operate with limited equipment, research funding and opportunities for mobility.

UNESCO has highlighted the importance of overcoming geographical and financial barriers to scientific infrastructure through mechanisms such as remote access to laboratories, specialised equipment, computational resources and research networks.

Publishing represents another obstacle. African researchers can face subscription paywalls when accessing existing knowledge and substantial article-processing charges when attempting to make their own work openly available. Researchers from less-resourced institutions may also have limited access to scientific writing, editing and international publishing networks.

These challenges are not entirely new. **Aida Opoku-Mensah**, then working at the UN Economic Commission for Africa, argued as early as 2007 that previous scientific cooperation initiatives involving Africa had been:

“few and far between” (European Commission, 2007, para. 3).

Discussing investment in scientific capacity, she also observed:

“Science’s role in development [...] is necessary, but nobody wants to invest in it” (European Commission, 2007, para. 4).

Almost two decades later, the fundamental challenge remains: Africa has scientific talent, but that talent is not sufficiently connected across the continent.

From fragmented collaboration to an African Research Area

One possible response would be the progressive establishment of an African Research Area: a continental framework through which researchers, institutions, knowledge and scientific infrastructure could circulate more easily across borders.

The objective would not be to centralise African science. Instead, it would be to connect existing capabilities.

Research mobility

Africa could establish a large-scale African Research Mobility Programme, supporting exchanges of three to twelve months between African institutions.

A Congolese researcher could conduct part of a project in Kenya; a Ghanaian AI researcher could collaborate with a robotics laboratory in Morocco; or a Senegalese epidemiologist could access specialised infrastructure in South Africa.

The principle would be to encourage the circulation of scientists within Africa, while maintaining international collaboration.

Shared scientific infrastructure

Every country does not need to possess every expensive scientific facility.

Regional or continental centres could provide shared infrastructure in fields such as genomics, artificial intelligence, robotics, climate modelling, astronomy, biotechnology and advanced materials.

The SKA already demonstrates what shared large-scale scientific infrastructure can achieve. Similar principles could progressively be applied to other disciplines.

A multilingual African research platform

Africa could also develop a common digital platform connecting researchers, laboratories, equipment, publications, datasets, doctoral opportunities and research funding.

Information could be searchable in **English, French, Arabic and Portuguese**, supported increasingly by AI translation.

Instead of depending on personal networks, an African researcher should be able to ask:

“Who in Africa is working on the same problem as me?”

and rapidly identify potential collaborators.

A Pan-African Research Fund

Scientific integration will remain difficult without dedicated funding.

A Pan-African Research Fund could prioritise projects involving institutions from several African countries and deliberately encourage collaboration across regions and linguistic communities.

For example, major grants could require participation from researchers in at least three African countries and two different African regions.

Funding would therefore become an instrument of scientific integration.

Strengthening African scientific publishing

Africa also needs stronger mechanisms for circulating its own scientific knowledge.

Continental repositories, open-access journals, shared research-data infrastructure and preprint platforms could increase the visibility and accessibility of African research. Initiatives such as the **African Open Science Platform** already provide foundations upon which a broader continental system could develop.

Science diplomacy with, for and by Africa

The objective should not be to reduce Africa’s scientific collaboration with Europe, Asia, North America or other regions. International partnerships remain essential.

The deeper question is **who defines the priorities and how African institutions connect with one another.**

South African scientist **Roseanne Diab**, then Executive Officer of the Academy of Science of South Africa, captured this principle when describing an African science-policy initiative:

“This is being organised by Africans so as to respond to specific African strengths, traditions and needs” (Science Diplomacy Capital for Africa [SDCfA], 2023, “Participant Quotes” section).

She also observed:

“Science-based issues are becoming more important to the conduct of foreign policy” (SDCfA, 2023, “Participant Quotes” section).

This suggests an important evolution in the continent’s approach: moving from science diplomacy with Africa, where African institutions partici-

pate in partnerships largely initiated elsewhere, towards stronger science diplomacy by Africa, where African countries and institutions collectively define priorities, mobilise resources and establish partnerships.

Africa does not need to build its scientific system from scratch. Universities, researchers, academies, laboratories, and successful international partnerships already exist.

What remains insufficient is the connective tissue between them.

The next stage of African science diplomacy should therefore ask not only:

“How can Africa collaborate more effectively with the world?”

but also:

“How can Africa make it dramatically easier for African scientists to collaborate?”

Moving from fragmented partnerships towards a continental research ecosystem could make science diplomacy not only an instrument of Africa’s international relations but an instrument of African integration itself.

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