



The Academy of Science of South Africa and science diplomacy

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The Academy of Science of South Africa (ASSAf) recently released its second report on the state of Scholarly Publishing in South Africa. Titled *Twelve Years Later: Second ASSAf Report on Research Publishing in and from South Africa*, the report outlines ASSAf's important role in promoting innovation and scholarly activity. However, ASSAf has a substantial range of other strategic goals; here I highlight those that relate to providing scientific advice to national government; playing a critical role in international science diplomacy (including transborder issues in and beyond Africa); and sharing best practice for other academies to engage in bilateral joint committees and action planning.

ASSAf was established in 1994/1995 and became the only national science academy formally recognised by the South African government in 2002, determined by the ASSAf Statute (*Act 67 of 2001*) – one of the earlier, beneficial results of the advent of democracy in South Africa. In order to fulfill its national and international roles, ASSAf adopted in its name the term 'science' in the singular, referring to 'knowledge' and reflecting a common way of enquiring rather than an aggregation of different disciplines. In terms of the Act, the Academy's mission is to:

1. recognise scholarly achievement and excellence in the application of scientific thinking for the benefit of society;
2. mobilise Members to ensure that they are available to contribute their expertise in the service of society;
3. conduct systematic and evidence-based studies on issues of national importance, producing authoritative reports that have significant impact on policymaking;
4. promote the development of an indigenous system of South African research publications, increasing their quality, visibility, accessibility and impact;
5. publish science-focused periodicals that will showcase the best of southern African research to a wide national and international audience;
6. develop productive partnerships with national, regional and international organisations with a view to building our capacity in science and its application within the National System of Innovation;
7. create diversified sources of funding for sustainable functioning and growth of a national Academy; and
8. communicate effectively with relevant stakeholders through various media and fora.

The activities described here are those that give substance to item 6 of the mission. In addition, what follows is supported by, and reinforces, other South African national policy frameworks such as the Ten-Year Innovation Plan, the National Research and Development Strategy, and the National Development Plan. The growing importance of the science content in critical foreign policy issues has required the South African government to pursue a concerted science diplomacy strategy in which ASSAf plays a significant role.

International cooperation

ASSAf's international responsibilities have increased markedly over the years, as its reputation has grown both locally and abroad. ASSAf has contributed to global statements and ensured the participation of its elected Members and other South African scientists in high-level engagements.

To give this effect, ASSAf has a number of strategic partners. The global network of academies, which in 2016 was renamed the InterAcademy Partnership (IAP), with three branches – IAP for Health, IAP for Science and IAP for Research – all based in Trieste, Italy, is one such partner. ASSAf plays a major role in the executive committees of all three branches with a mandate to represent developing nations.

ASSAf also works with the BRICS science academies and is championing the formation of the BRICS network of academies of science. This relation is intended to enhance collaboration between the academies of the five countries under a common framework, and to offer science advice to the BRICS annual summit. ASSAf has also been involved in the formation of the International Network of Government Science Networks (INGSA) Africa Chapter and still supports that Network. Through the G20 country academies of science, which are called the Science 20 (S20), ASSAf engages actively in science diplomacy through statements, reports and other activities that provide science advice at senior levels. ASSAf also vigorously profiles and encourages South African scientists to contribute at international levels as individuals or as technical backup to science diplomacy.

The World Academy of Sciences (TWAS) is another strategic ASSAf partner, and since 2015 ASSAf has hosted the TWAS Southern Africa Regional Partner (TWAS-SAREP) office. The main objective of TWAS-SAREP is to promote the goals of TWAS in the region, with a strong focus on awarding prizes and supporting young scientists. The Regional Partner supports science diplomacy training on the continent and networking among young affiliates through the TWAS Young Affiliates Network (TYAN), and ensures that the Regional Young Scientists Conference is held in a range of African countries – especially those lagging somewhat in science development. In this way, TWAS-SAREP works with national young and senior academies and assists in academy development.

A further strategic partner is the International Science Council (ISC); ASSAf also hosts the ISC Regional Office for Africa (ISC-ROA). There is a close alignment between the goals of ASSAf and ISC-ROA, particularly in terms of Africa-wide collaboration, thematic areas of interest and promoting young scientists, all of which present significant

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opportunities for synergistic partnerships. ASSAf is currently strengthening and consolidating South–South relations, reflecting a shift in the balance of the global distribution of power as well as the increasing influence of emerging economies in the multilateral science and innovation system.

Overseas collaboration

Collaboration covers bilateral and multilateral agreements with overseas academies of science, support for overseas strategic partnerships, and engagement with multilateral organisations such as the European Commission – among others. ASSAf brings overseas academies to the continent to support African collaborations, women in science and technology, and young scientists, including the South African Young Academy of Science (SAYAS) and TWAS-SAREP as flagships of ASSAf. It also links overseas academies and partners with other programmes within ASSAf for collaborative activities.

In this respect, ASSAf engages actively with the German National Academy of Sciences – Leopoldina – with which they have undertaken several joint activities. ASSAf also engages with other academies, especially those with which the South African Department of Science and Technology (DST) has ongoing or planned bilateral cooperation, and participates in Joint Committee and Action Planning Meetings with countries that have signed bilateral cooperation with the DST to ensure that academies of science of both countries can provide science advice in jointly selected priority areas. Currently, ASSAf has Memoranda of Understanding (MOUs) with Germany, Austria, China, Belarus and India, and is currently renewing bilateral agreements with Russia.

In addition, ASSAf has worked with the British Academy, the American Association for the Advancement of Science (AAAS), the Royal Society in the UK and other academies on a number of collaborative activities – and has begun working with a network of diplomatic missions and embassies based in Pretoria. Through the Embassy Lecture Series, ASSAf has access to high-profile scientists and policymakers invited to South Africa. Working jointly with visitors' home country embassies, ASSAf hosts lectures by these visitors across South Africa. Lectures have already been held in collaboration with the USA, Switzerland, UK, Italy and New Zealand. Other embassies have expressed interest in this initiative. The Embassy Lecture Series is, among other things, an entry point for ASSAf to work with academies of countries that have embassy missions in South Africa.

On a multilateral level, ASSAf is an implementing partner of the European Union Horizon 2020 Programme and is responsible for reporting on the participation of South African and European scientists in this framework of research funding. ASSAf is also involved with other Regional Networks of Science Academies in Europe, the Asia-Pacific region and Latin America to ensure that South African scientists can participate in activities created by these academies, and to assist ASSAf in developing collaborations with individual member academies. ASSAf also works with the Human Rights Network of Academies. Particular attention will, in the coming year, be paid to the establishment of new links with the BRICS group of academies and the BRICS Network of Science Academies. The network will position itself so as to be able to give science advice to the BRICS Summit.

ASSAf works with Commonwealth Academies of Science with the support of the Royal Society in the UK, and, as mentioned above, with science academy members of the G20 countries – the so-called Science 20 (S20) – to provide strategic foresight and science advice to the G20 Summit through statements produced annually. ASSAf also has links with G20 international offices in Tokyo and Brussels through South Africa's diplomatic missions, which are dedicated to promoting cooperation with Japan and the European Union. ASSAf works closely with the DST-seconded official to the secretariat of the Southern African Development Community (SADC) in Gaborone, Botswana. In multilateral frameworks, South Africa seeks to encourage and support scientific cooperation and the building of trust and relationships among its partners, and to foster consensus on contentious or difficult issues.

African collaborations

African countries face many common development challenges and are bound by the pan-African policies of the African Union Commission.

Academies have a major role to play in collectively addressing these matters. South Africa's future is directly linked to that of Africa, and it follows that, through its Africa Strategy, ASSAf continues to support regional and continental academy development processes, awareness-raising and science advocacy, especially for investment in research and development by African governments. ASSAf works with the Network of African Science Academies (NASAC) in strengthening African science academies and establishing new ones, especially within SADC. To this end, ASSAf has been in discussions with Angola, Lesotho, Namibia and Eswatini (formerly Swaziland), and, based on that engagement, Eswatini has established the Kingdom of Eswatini Academy of Science and Angola will soon be establishing its own academy. ASSAf made a presentation to the SADC Ministers responsible for science and technology in Eswatini in June 2017, following which the Ministers committed to the formation of new academies and the supporting of existing academies. ASSAf also assisted in the formation of the Botswana Academy of Science.

Beyond the SADC, ASSAf supported the Rwanda Academy of Science to develop a constitution, thus enabling them to apply for registration as a member of NASAC. ASSAf has MoUs with academies in Benin, Nigeria, Senegal, Uganda and Mauritius and partners with these and other academies on both bilateral and multilateral levels.

It is important to note that ASSAf participates in Joint Committee and Action Planning Meetings for African countries that have Science and Technology bilateral agreements with South Africa. ASSAf recognises Africa Day and uses it as a key opportunity to raise awareness of science on the continent, and also works with the Next Einstein Forum on Africa Science Week.

ASSAf conducts colloquia for scientists in the South African diaspora in other African countries – the largest number being from Zimbabwe, Nigeria and Kenya. In addition, ASSAf collaborates with the Science, Technology and Innovation (STI) hub of New Partnership for African Development (NEPAD), the African Academy of Sciences (AAS) and ISC-ROA in developing a database of African scientists. ASSAf is positioning itself as a critical contributor to the implementation of the Science, Technology and Innovation Strategy for Africa (STISA-2024) and towards achieving the Sustainable Development Goals. Working with TWAS-SAREP in all its activities, ASSAf promotes Science Diplomacy in Africa: in 2018, ASSAf began championing science diplomacy training at home and in the rest of Africa with partners such as AAAS, TWAS and DST. In March 2018, ASSAf hosted the first session of TWAS and AAS Science Diplomacy training in Africa. This training had previously always been held in Trieste. Other training sessions will be held in four other TWAS Regional Partner Offices, beginning with Egypt in 2019. The Academy is working with DST to conceptualise a curriculum for South African Science Diplomacy, to be launched in 2019.

Finally, ASSAf is working to strengthen links within SADC, especially on STI and the Gender Protocol. With TWAS-SAREP and ISC-ROA currently being hosted at ASSAf, and in collaboration with NASAC and other continental science entities, ASSAf ensures that the best African scientists from these organisations are involved in the continental science advice ecosystem.

Young scientists and gender-related activities

Since 2010, ASSAf has hosted an annual Young Scientists' Conference, aligned to the themes of the International Year of the UN or the AU, as part of its commitment to supporting the development of young scientists. ASSAf provides funding to SAYAS for its operational activities in its mission to support the growth of the young academy. ASSAf also assists SAYAS in raising its profile within the Global Young Academy and with other African science academies. In this way, ASSAf creates opportunities for joint activities with SAYAS and ensures that SAYAS Members participate in ASSAf's Standing Committees and study panels.

ASSAf has actively supported the nomination of young scientists for awards and leadership opportunities and acts as the implementing agency for some of these, including the BRICS Young Scientists Conference; TWAS Regional Young Scientist Prize and TWAS Young Affiliates' Young Physician Leaders Programme which is linked to IAP for Health and the

World Health Organization; Lindau Nobel laureate meetings; and AU-TWAS Young Scientists' Prize.

The Organization for Women in Science for the Developing World (OWSD) South Africa National Chapter is hosted by ASSAf, and all gender-related activities in ASSAf have been coordinated through the work of this Chapter. ASSAf has assisted other SADC member states (Eswatini for example) to establish Women in Science, Engineering and Technology (WISET) National Chapters. The WISET National Chapters were introduced by SADC through a charter and every country should have one by mid-2019.

ASSAf has also been the focal point for GenderInSITE in the southern African region since 2015. GenderInSITE is a global initiative that aims to raise the awareness of decision-makers on gender aspects of the Science Innovation Technology and Engineering (SITE) initiative, aimed at both men and women. Through this initiative, ASSAf has had an opportunity to consolidate and strengthen gender-related activities and policy influence across southern Africa. Through GenderInSITE, ASSAf has been working with SADC Member States to produce factsheets for the monitoring of the implementation of the Gender Protocol.

Of course, ASSAf does not have exclusive responsibility for matters related to science diplomacy and works closely on matters of mutual interest with a wide range of science councils and with government. Many of South Africa's national science councils or other public-funded research and technology organisations also have teams dedicated to international cooperation. One of these is the National Research Foundation (NRF), which is responsible for the implementation of international science and technology cooperation agreements. The ASSAf science diplomacy agenda comprises multiple initiatives, but all target strategic national priorities.

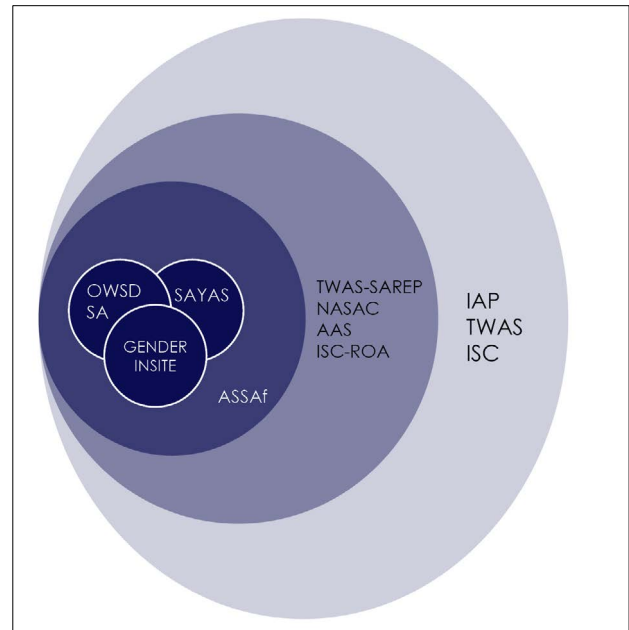
ASSAf's priorities for science diplomacy can perhaps best be summarised by emphasising that international scientific cooperation is pursued both as an objective in its own right and as an instrument to attain strategic national and foreign policy objectives. Its international relations often provide some of the resources that ASSAf seeks to support activities that are not funded through the baseline budget. In 2019 alone, the International Liaison Programme raised ZAR15 million in support of science diplomacy interventions. These diplomatic interventions have all played a part in ensuring that 'science for sustainable development' enjoys priority focus in global forums.

Conclusion

One of the current flagship areas for South African science diplomacy is radio astronomy in Africa, specifically the Square Kilometre Array (SKA). ASSAf supports SKA and includes it as an example in science diplomacy training and other engagements in Africa and beyond. Certainly, there is a positive picture of ASSAf's science diplomacy efforts and much to be proud of. Nonetheless, a more detailed analysis might also interrogate

the obstacles, dead ends, and frustrations that international cooperation faces, but that will need to wait.

As described above, ASSAf's science diplomacy agenda comprises, and has achieved success in, five areas: developing and maintaining (1) strategic partners; (2) African collaborations; (3) overseas collaborations; (4) young scientists' liaison; and (5) gender equality in science, technology and innovation (Figure 1). The dynamic interfaces between these five components will certainly increase. This is perhaps the largest challenge for ASSAf's future science diplomacy engagements: to have an agenda that is sufficiently focused in order to ensure an optimal investment of resources, but sufficiently flexible to be able to respond to the rapidly changing dynamics of international relations in the 21st century, which, if not driven by science, most certainly will require science-based responses and support.



IAP, The InterAcademy Partnership; TWAS, The World Academy of Sciences; SAREP, Sub-Saharan Africa Regional Partner; ISC, International Science Council; ROA, Regional Office for Africa; NASAC, Network of African Science Academies; AAS, African Academy of Sciences; SAYAS, South African Young Academy of Science; OWSD, Organization for Women in Science for the Developing World

Figure 1: ASSAf's science diplomacy agenda comprises overseas (outer circle) and African (middle circle) collaborations as well as young scientists' liaison and gender equality in science, technology and innovation (inner circles).