

ASSAf turns 20

ASSAf and SAJS

ASSAf and
scholarly
publishing

ASSAf and
science advice

Academies in
Africa

ASSAf and young
scientists



Applying scientific
thinking in the
service of society



SOUTH AFRICAN Journal of Science

In commemoration of the 20th Anniversary
of the Academy of Science of South Africa

2016

The Academy of Science of South Africa turns 20

In 2010, a *Leader* in the *South African Journal of Science* set out a reasoned case for the coherence of ‘science’ rather than of ‘the sciences’ (as conventionally and colloquially considered to be ‘the natural sciences’) as encompassing all rigorous intellectual enquiry:

ASSAf, after considerable debate, and at some risk to its evolving support base, opted for the standpoint that a national ‘science academy’ should basically be devoted to the promotion and use of the open-ended and evidence-based way of enquiry that is common to all empirical disciplines (hence ASSAf would be an ‘Academy of Science’, not of ‘Sciences’).

This is the foundation on which the Academy of Science of South Africa (ASSAf) was founded in 1996. It remains the basis from which ASSAf and the *South African Journal of Science* continue to operate.

Twenty years on from 1996, the wider world of science has caught up with ASSAf, as the International Council for Science (ICSU) and the International Social Science Council (ISSC) announced their move towards a merger:

At an extraordinary General Assembly of the International Council for Science (ICSU) and a General Assembly of the International Social Science Council (ISSC), the two organizations’ members voted overwhelmingly that the two organizations should merge. This in-principle decision followed a recommendation by the two organizations’ executives, setting the two councils on a trajectory to become one by October 2018.

The planned merger represents as broad an acknowledgement of the universality of what ‘science’ means, as might possibly be hoped for.

To celebrate ASSAf’s far-reaching vision and its considerable scientific achievements over the last 20 years, the *South African Journal of Science* asked leading South African scholars to outline ASSAf’s role in core areas such as scholarly publishing, science advice, the role of academies and young scientists.

The six articles that form the body of this compilation are these contributions – published throughout 2016 – that highlight the highly productive and influential work of the Academy through its inception to the present.

The editorial team is both privileged and pleased to be able to share these insightful and valuable contributions with you and we look forward to witnessing ASSAf’s scientific achievements over the next 20 years.

John Butler-Adam 
Editor-in-Chief

ASSAf turns 20: Young enough to be dynamic and old enough to be trusted with its mission

Some national science academies boast of their long histories, and (to adapt in a more positive direction Churchill's malicious gibe about the modesty of his political opponent Attlee) they mostly have a lot to be boastful about. If longevity is to be the main criterion on which the merits of an academy are to be determined, however, the case for starting a new one would be weak. The fact that the 'academy idea' has by now taken root in a majority of UN member nations, and the number still is increasing, shows that an alternative interpretation is correct: like universities, science academies have strong survival prospects in societies because they are in principle, and often in practice, a demonstrable 'public good'.

Again, as in the case of universities, making sure that a science academy is a real national asset requires considerable effort; the benefits do not simply fall from the sky.

A new academy that adopts and steadfastly maintains a fresh and contemporary approach to its mission within the core framework of practice can readily become a star performer. The argument will be made here that South Africa's national science academy has achieved this status, after only 20 years, despite having had to contend with many difficulties in its operating environment since its inception in 1996.

The process to establish the national academy – the Academy of Science of South Africa (ASSAf) – took about 5 years and was aligned with the momentous events that led to the first democratic election in South Africa in 1994. The nine-member planning team began its memorandum with the following set of assertions:

Scientific thought and activity enrich us profoundly; they empower us to shape our living environment; they are keys that can open the doors to a peaceful and prosperous future. In a free society, an academy of sciences can be at once a symbol, an inspiration and a source of reliable counsel. It should take a form which is appropriate for the time and the place, allowing for further development through flexibility in its constitution. It should be fearless in its principal mission to respond with effective advice and action to our collective needs, dangers, opportunities and challenges.

A way was then forged for the new, inclusive academy to be formed, designed to serve all the country's people as captured in the slogan 'science for society'. Parliament passed the *ASSAf Act* in 2001, 'licensing' ASSAf to receive public funding and to carry out its mission as the sole national science academy, also representing the country internationally in this arena.

ASSAf was intended by its founders (and by its parliamentary sponsors) to retain the best of the global academy tradition, but to be of this time and this place. Thus the constitution adopted by the nascent academy reflected an important principle that allowed ASSAf to jettison many out-of-date notions that were still carried forward in the academy tradition by older academies. Amongst these was the idea of academy fellowship or membership being a kind of reward for past academic efforts, a club of 'haves' which looked down on 'have-nots'. Another discarded viewpoint was one which regarded the word 'science' as synonymous with 'natural science' or 'hard science', the preserve of people who regarded themselves as the only 'proper' scientists. Yet another rejected approach was to regard science academies as merely bringing under

one privileged roof a number of different disciplines ('the sciences'), all constituting separately communities in each of which the constituent brains have 'constructed' themselves irreversibly into a unique mode of thought.

The newcomer, ASSAf, after considerable debate, and at some risk to its evolving support base, opted for the standpoint that a national 'science academy' should basically be devoted to the promotion and utilisation of the open-ended and evidence-based *way of enquiry* that is common to all empirical disciplines (hence ASSAf would be an 'Academy of Science', not of 'Sciences'). This approach meant that the distinctive powers of many disciplines would be harnessed to common purpose, at the highest level, to address societal problems – the principal mission of the organisation. The principle also made it logical (although still internationally unique) that elective membership of ASSAf would be based on the double criteria of excellence in science (across the entire disciplinary spectrum) *and* success in applying such high-level scientific thought for the benefit of society; it was thought that such scholars would find it easier to cross boundaries and relate to one another in a mutually respectful manner in a volunteer system of joint intellectual service.

ASSAf has published the century-old *South African Journal of Science* since 2002, and launched its science magazine *Quest* a few years later; both are multidisciplinary, and in their different ways are key vehicles for promoting the same cohesive principle espoused by ASSAf in its 'science-for-society' mission.

A further aspiration, present but not explicitly articulated in the founding decisions of ASSAf, was to avoid the gerontocracy so characteristic of older academies. This was partially addressed by the above-mentioned principles but given substantive form by the creation of the ASSAf-affiliated South African Young Academy of Science (SAYAS) in the second decade of ASSAf's existence.

ASSAf was also determined from the start to break down the infamous 'Limpopo curtain' that had prevented South African scholars from interacting with their northern neighbours and the rest of the continent – ASSAf wished to be part of a cooperative regional academy system. The opportunity to embed itself in this way came with the African Science Academy Development Initiative (ASADI) sponsored by the US National Academies from 2005 onwards, providing contact points, joint conferences and projects, and a substantial increase in the number of partner African science academies. The focus of mentoring provided through the initiative by the US National Academies was on best practice in the generation of evidence-based advice, and this assistance underpinned the central role of this activity for the African academies, including ASSAf. Towards the end of its first 20-year period, ASSAf was requested to host two African-region branches of international academy-linked bodies – the Regional Office for Africa (ROA) of the International Council for Science (ICSU), as well as the Regional Office for Sub-Saharan Africa of The World Academy of Sciences (TWAS). The 'Limpopo curtain' is certainly no more...

The value of a fresh approach to ASSAf's agenda was shown in various ways during its difficult setting-up period. In the decade before there was a significant track record of authoritative, evidence-based advice generated in the national interest, ASSAf in its core constituency of well-established researchers and scholars appeared, in traditional 'academy terms', to be junior to the two rival but largely sectoral bodies of the 'old South Africa': the Royal Society of South Africa (RSSAf) and Die Suid-Afrikaanse Akademie vir Wetenskap en Kuns (SAAWK), both of which have continued to exist after ASSAf's formation. During the

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second half-century of its existence, the RSSAf had been in decline, with limited resources and influence. SAAWK, by contrast, functioned during the same period as the *de facto* national science academy of the country, one of the pillars of the Afrikaner-dominated state, recognised and funded by Parliament as a statutory organisation, extensively supported financially by the private sector, but involved in national policy formulation almost entirely 'off the record' and unaccountably. ASSAf, as a differently conceptualised newcomer whose primary purpose was to serve the whole society through scientific thinking across disciplines and not within disciplines, has by now fully established itself in its demonstrable commitment to transparency (all its reports are in the public domain), best consensus arising from multiple perspectives, and high quality as assured by independent and multiple peer review.

It is striking that some of the most influential leaders of advanced country academies began to advocate a shift from the traditional inward-looking focus of such bodies more or less at the time that ASSAf was being established, moving towards the same foregrounding of societal service in the form of consensus advice generated by a full review of available evidence across the disciplinary spectrum. ASSAf was recognised as having pre-aligned itself with this shift, believing firmly that a national science academy in the modern era exists primarily to make possible the efficient and effective mobilisation of a nation's intellectual 'firepower' to address its most urgent problems. It was consequently not a surprise that ASSAf was elected to membership of the first InterAcademy Council (IAC) when this was formed in 2000 to drive the performance of international consensus studies on issues of global importance.

ASSAf's first major consensus report on research publishing in and from South Africa (commissioned by government) was released in 2006 after extensive process guidelines had been developed for ensuring that the panel-based reviews were independent, reflected a best consensus of multiple perspectives, and were of a high scholarly standard (including thorough peer review). This report led to the launching of an ASSAf-led and government-funded programme to improve and support scholarly publishing in multiple ways, including the setting up of the National Scholarly Editors' Forum, acceptance of a National Code of Best Practice in journal editing and peer review, and the launching of a fully indexed, open-access e-platform (SciELO SA) already presenting the full-text of 60 local scholarly journals which have passed scrutiny by discipline-grouped ASSAf peer-review panels. This activity has had, and is still having, a significant and broad impact on scholarly practice in South Africa.

The advisory function espoused by ASSAf is by now also performed in various ways other than full consensus reviews. Well-organised and highly participatory forum-style workshops on problem areas can provide an indication relatively quickly of a 'beginning consensus' on priorities and possible solutions. 'Informed high-level consensus' opinions on key government strategies can be generated in short order by well-constituted expert panels if required urgently. Concise position papers can be released on matters of public controversy or confusion. ASSAf can also act as a channel within the country for the dissemination of consensus reports and advisories emanating from regional or global academy groupings or agencies, such as those produced by the IAC already mentioned. In every case, the ASSAf Council is charged with the final approval-and-release decisions, based on process correctness and scholarly quality: the Council is publicly accountable for maintaining the good reputation of ASSAf but does not 'second-guess' the findings and recommendations of its appointed panels.

One year after the groundbreaking research publishing report, ASSAf on its own initiative produced a consensus report on the evidence base concerning possible nutritional influences on the pandemic diseases caused by chronic HIV and *Mycobacterium tuberculosis* infection; the findings helped to end a disastrous period of 'HIV denialism' in South Africa and to initiate a concerted national programme of science-based healthcare to mitigate the damage to society and the economy that these diseases were causing. This report was widely reported internationally and acclaimed as a clear indication that Africa's science academies were independently capable of playing a significant role in addressing key issues affecting their societies.

Only 9 years after these two reports and many other consensus reviews, forum proceedings, advisories and position papers later, an ASSAf consensus report on policy issues concerning gender orientation in Africa, prepared in partnership with the Ugandan Academy of Sciences, was praised as courageous and timely in a lead editorial and feature article in *Nature*. The 'teenage academy' was now deemed worthy of frontline international attention.

In the face of this good record, it is finally necessary to discuss two caveats, the chief causes of concern on the part of ASSAf leadership and its supporters. One is the issue of independence, important for a body that needs government funding to maintain and build its infrastructure, as well as funding on a contractual basis for commissioned reviews or other forms of advice. The principle of accountability makes it appropriate that the use of taxpayer money by an independent (although statutory) academy should require formal proposals, budgets, financial reports and audits, and be assessed against performance. This unavoidably opens up the possibility of top-down control within a system where most other public entities are as clear-cut government agencies subject to such direct control, even within the parameters of their respective statutes. It stands to the immense credit of the government department responsible for ASSAf's public funding, the Department of Science and Technology, and the government more broadly, that they have appreciated the fact that the only good national science academy is an independent one, and have acted accordingly.

The second worry is the still inadequate realisation on the part of researchers in the public sector (universities and research councils), as well as those in the private sector, of the difference between the processes of prospective research into matters of importance, which may or may not create evidence for policy, and the systematic, consensus-seeking review of already available evidence by research-experienced experts with multiple disciplinary perspectives, in ways that are directly designed to provide an evidential basis for policy. While there is no *prima facie* reason why the second mode of investigation cannot be done in a university or research council setting, it is simply much better and more cost effective when it is performed by an academy which can effectively mobilise any number of appropriately equipped volunteer scholars from any number of skills areas, see to a high level of quality assurance, and ensure transparency, all in a fully accountable manner.

Science academies of the kind that ASSAf aspires to be will be judged mainly on their track records in assisting society. A promising start has been made, and one can justifiably be optimistic about a second 20-year period of high-level achievement in this sphere.

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ASSAf: Promoting scholarly activity through the SAJS

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The *South African Journal of Science (SAJS)* is an integral part of the Academy of Science of South Africa's (ASSAf's) core activities, responding directly to one of ASSAf's five strategic goals, namely the promotion of innovation and scholarly activity in South Africa, with a special emphasis on all forms of interdisciplinarity based on the core and common role of empirical enquiry. ASSAf's role as publisher of the journal is critical to the strategic direction and successful implementation of its scholarly publishing and open access activities. The SAJS is at the forefront of many new initiatives that ASSAf is introducing and that will influence the future of scholarly publishing in our country.

Dating back to 1903, the SAJS was first published as the proceedings of the annual meetings of the South African Association for the Advancement of Science, now known as the S₂A₃. A glance at the contents page of the first volume reveals a focus on topics not much different from the burning issues of today; there was a presidential address by Sir David Gill, a Scottish astronomer who spent much of his career in South Africa, and articles titled 'The Moral Education of Children in Schools', 'The Life of the City', 'Sewage Disposal in the Cape Colony', and 'Some Aspects of South African Forestry'.

In August 1947, the annual report became a monthly publication and the journal was published under the auspices of various bodies, including Macmillan Journals in London (the then publisher of *Nature*), the Associated Scientific and Technical Societies of South Africa, the Foundation for Education, Science and Technology, and the National Research Foundation. There were some difficult times over the years, but the journal sustained itself without interruption.

In 2002, a nascent ASSAf took the bold step of assuming responsibility for the publication of the SAJS, with the aim of building the journal's reputation as an independent scholarly journal of the multidisciplinary type. At the time the journal was in sound editorial hands, but needed a visionary approach to take it from a paper-based journal that had a relatively narrow focus of 'natural scientific' interest to one that is entirely digital and open to good papers from all empirical fields of enquiry. In keeping with the dual content of the world's leading multidisciplinary journals, the SAJS now aims to be the foremost repository of editorial comment, scholarly debate and review, and science and technology policy analysis relevant to South Africa. This lofty goal is still a 'work in progress', but significant strides have been made.

The journal's success is due in no small measure to the dedication of its succession of recent editors. The first of these was Dr Graham Baker, who arrived in South Africa in 1972 after a science publishing career with *Nature* in London. He set about the demanding task of taking the journal from a barely viable condition to a flagship multidisciplinary journal modelled on *Nature*. For 36 years, as full-time Editor, he dedicated himself to the establishment of the SAJS as a high-quality, internationally significant journal that showcased South African natural science research to a global audience.

Towards the end of 2008, ASSAf introduced a new editorial model, with Prof. Michael Cherry as part-time Editor-in-Chief, supported by ten part-time Associate Editors in various disciplines. It was at this time that the focus of the SAJS was also deliberately broadened, specifically targeting the hitherto neglected humanities and social sciences. Since then, submissions in the fields of the humanities and social sciences have steadily increased, warranting a recent decision to expand from one portfolio into two (each managed by an Associate Editor).

In 2009, the SAJS fully embraced open-access publishing and was the first South African journal to be uploaded onto ASSAf's new open-access platform, SciELO SA. Changes also took place in publishing mode, with the adoption of an online manuscript management system for the submission, peer review and publication of papers, now outsourced to OpenJournals Publishing. Digital publishing introduced new file formats (HTML/XML and EPUB), reference linking and DOIs for enhanced searchability and user friendliness. Embarking on digital publishing was a steep learning curve but was achieved through the dedicated efforts of a large number of people who set the SAJS on a course from which there was no turning back.

Dr John Butler-Adam took over as part-time Editor-in-Chief in November 2012. His assumption of the editorship coincided with ASSAf once more itself taking control of the publication of the journal – a move which brought with it exciting possibilities, but also a new set of challenges. At the same time, there was a rapid increase in the number of articles being submitted for publication from all parts of the world as the accessibility and reputation of the journal began to increase. The increased responsibilities in the ASSAf secretariat, together with the opportunities and demands of digital publishing, saw the creation of the post of Online Publishing Administrator in 2013, with Ms Nadine Wubbeling appointed part-time and later full-time in the role.

Digital publication of the SAJS has steadily become the dominant mode. Initially, the SAJS was published in dual mode, both print and digital, with the printed journal distributed free to ASSAf Members. In 2014, a decision was taken to discontinue the free distribution of hard copies and to focus on electronic distribution. Effectively, the hard copies were reduced from 700 to just above 100. Recently, the ASSAf Council approved the discontinuation of the print version in favour of electronic distribution via the bimonthly 'Highlights of the latest issue' emails that now reach over 9000 recipients. These emails include links to the full digital issue in three formats (PDF, EPUB and flip ebook) and are sent at a minimal cost of ZAR0.14 per recipient.

Digital publication has also ushered in new and sophisticated possibilities in terms of impact monitoring, so important in this era of ensuring effective utilisation of state funding and competing demands for resources. Using Google Analytics, one can capture data on readership by country, city and article. The *SAJS* has a developing social media presence: it has a Facebook page with 831 'likes' as of December 2015 and an active Twitter account, with 553 followers and 730 tweets. Media reporting of *SAJS* articles is monitored closely and is showing a pleasing growth.

It is planned to introduce Altmetric software that will also include alternative metric 'counts' and statistics from social media, blogs, news coverage and other online sites. Article-level metrics such as full-text downloads and citations will also be included for each new article.

The all-important Thomson Reuters Web of Science impact factor has shown a steady rise and is standing at 0.96 in 2015, up from 0.5 in 2010. The *SAJS* at 1848 cites ranks second among the South African journals on Thomson Reuters Web of Science in terms of citations.

The face of the *SAJS* has thus changed dramatically over the past few years. Much has been learned, and ASSAf is now able to assist other South African scholarly journals to benefit from the enormous advantages of open access and digital publishing through the National Scholarly Editors' Forum.

While the *SAJS* is currently in a very healthy state and is a publication of which the Academy is justifiably proud, there are still challenges to address, of which two can be regarded as foremost.

The first is the need to encourage submissions of higher-quality papers. As submissions have increased, it has become possible to be more selective, thereby increasing the rejection rate, which is often used (in a rather perverse way) as a measure of the quality of a journal. The

formal rejection rate, excluding those which are informally submitted to the Editor-in-Chief for an opinion, is currently hovering just above 85%, which is a healthy sign. Submissions have increased at an unprecedented rate, from just above 200 in 2009 to almost 500 in 2015. At this annual growth we are expecting to reach 600 submissions in 2017. While this is a measure of success and improved profile, it comes with numerous practical problems relating to costs, capacity constraints, publishing backlogs, reviewer fatigue etc., all of which have to be addressed.

A second and related challenge is the need to position the *SAJS* as a 'destination journal of choice'. All too often one hears the refrain that international specialist journals should be the first choice, with the *SAJS* placed fairly low in terms of preferred journal. The challenge is one of influencing the mindset of South African researchers such that the *SAJS* is not viewed as a last-resort local journal to which one can turn after one's paper has been rejected by a specialist international journal, but as an outlet where an author deliberately crafts an important paper for a multidisciplinary audience. It should be seen as an opportunity for scientists to communicate their work beyond a specialist audience and to make their work broadly accessible to a multidisciplinary audience and thereby improve impact on society. Increasingly, scientists need to pay attention to effective and broad-based communication of their results; it is no longer considered sufficient to confine results to specialist journals. As the pressures to communicate in the popular press and through social media are becoming more and more important, so the multidisciplinary journal is firmly establishing its niche. The role of South Africa's foremost multidisciplinary journal is fundamental to building the reputation of South African science and packaging it in a way that is positioned midway in the spectrum that extends from specialist to popular. There is still a journey ahead to realise this ambition, but the *SAJS* is now on an upward trajectory that could see this being achieved sooner rather than later.



The essence of scholarship: Charting a path through the thickets of scholarly publishing

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The history of scholarly journal publishing is generally dated from the appearance of the *Philosophical Transactions of the Royal Society of London* in 1665.¹ The notable features of this publication are that it is the property of a learned society, and at the time of its inception reflected the deliberations of the scholars of the day from across Europe. It gained its stature from contributions by members of the learned society and the esteem of a broader scholarly community that used it as a vehicle to exchange ideas. Since the inception of the notion of the 'scholarly journal', the number of journals, and the range of subjects covered, has proliferated dramatically. In addition, the model for journal publishing has moved from the historical learned society publisher through to the emergence of large commercial publishers who dominate the market. The rise of electronic publishing has made it possible for predatory publishers with no pretensions of quality to join the fray. The various journal databases currently list in excess of 30 000 reputable titles and with the emergence of open-access online journals, the number is being proliferated extravagantly and with little regard for the quality of what is published. For an aspiring scholar who is looking for a credible vehicle in which to publish his or her work, the choices are bewildering. But informed choices are crucial for establishing a scholarly reputation. Thankfully, help is at hand in the form of the work that has been done in South Africa to enhance the reputation of local scholarly journals.

In South Africa, a variety of initiatives has been launched in the past by groups of academics and learned societies to establish journals as vehicles for scholarly communication. Indeed, there was even a government initiative that started in the 1970s to provide an infrastructure to support selected South African journals and enhance their impact in the global scholarly community.² With the demise of these initiatives in the 1990s, the local scholarly publishing landscape appeared drought-stricken until the turn of the 21st century.

However, two local interventions have played a crucial role in the lives of scholars who are intent on having their work published and establishing their reputations. The first of these was the introduction by the Foundation for Research Development (ancestor of the current National Research Foundation (NRF)) of a rating system for individual scholars in 1985. The rating of individuals was based on peer review of their scholarly contributions to their disciplines. The ratings essentially assessed whether they were recognised by their peers as falling in the broad categories of being international leaders in their fields, being recognised internationally for their contributions, or being recognised nationally. This assessment was based on the evaluation of the significance of a person's particular contributions to the scholarly literature and was influenced by the quality of journals in which the work appeared. The ratings given to scholars became an important factor in the development of academic careers, particularly when scholars in the humanities and the social sciences were included in these ratings.

The second intervention was the change to a funding framework for universities in 2003³ that provided an output subsidy for scholarly publications in journals, conference proceedings and books. For universities, maximising the number of these outputs was an important source of income, while for the government department providing the funding, this was meant as an incentive to enhance research performance, but with quality criteria built into the recognition of these outputs.

An aspiring scholar in 2004 was confronted with competing demands of the NRF for quality of scholarly work related to high ratings, and their institution's demands, both for an NRF rating and a greater number of outputs to enhance income through the research output subsidy. This latter problem of numbers could be partially finessed using South African journals that had a special position as recognised journals for subsidy purposes. The use of 'in-house' journals for this purpose was clearly an attractive option to pursue if the level of NRF rating could be traded off against income generation.

First report on scholarly publishing in South Africa

Into this conflicted terrain of scholarly publishing politics stepped the then newly established [Academy of Science of South Africa](#) that was asked by the then Department of Arts, Culture, Science and Technology (DACST) to initiate a study of research publishing in South Africa. The impetus for this request came from the understanding at the time that roughly half of the research outputs from South Africa came from publications that were in Web of Science listed journals and the other half were in journals that were not listed by Web of Science but recognised by the Department of Education. Indeed, 219 South African journals were recognised by the Department of Education in 2004. The journals were diverse and it appeared that 'their primary purpose may not be communication and documentation of original research in a global knowledge system.'⁴ In view of these reservations about the quality of local journals, the DACST requested that the Academy carefully examine the evidence available regarding South African research journals and develop a new strategic framework that would be comparable with the situation prevailing elsewhere in the global academic environment. This DACST contract was to be a profound test of the young Academy's ability to undertake a thorough investigation that would lead to implementable policy recommendations.

The [report](#) took as its starting point the identification of key properties of a research journal that would provide a reliable record of new knowledge being added to the global corpus of scholarly knowledge. The authors of the report identified three essential characteristics that all credible research journals needed to exhibit. The first was that readers should be able to place an absolute reliance on the integrity of the research results being presented, in terms of both methodology and interpretation. The second was the core role of the editor in managing the evaluation of submitted manuscripts and the peer-review system associated with their evaluation. Finally, the authors of the report recognised that the nature of scholarly publishing was changing radically and that the

electronic dissemination of research information was changing the nature of the scholarly enterprise in ways that were evolving rapidly and needed to be assessed. In this latter respect, the report was particularly prescient when it was initiated in 2001.

The work required for careful examination of the evidence was concluded in 2005 and the report was published in 2006. This report provided an incisive analysis of scholarly publishing and remains an extremely useful source of information to guide both authors and journal publishers in carrying out their respective roles responsibly. For example, there is a very useful definition of a South African journal^{1(p.2)} in order to avoid arguments about what 'South African' journals are. In addition, the analysis of South African journals at that time provided a unique insight into the state of local scholarly publishing, not all of it very flattering. As with all reports of this kind, it provided a range of recommendations for the appropriate government departments to consider in the development of their policies and for the sector to consider as journals and their editors grappled with the findings.

Impact of the report

In the decade since the report was published, what impacts have the recommendations had?

All ten of the recommendations have been largely implemented with the Department of Science and Technology and the Department of Higher Education and Training (DHET) partnering with the Academy to achieve the vision set out in the original report, of establishing a vibrant local scholarly publishing environment that engages globally in making South African knowledge generation visible. In addition, there has been an attempt to ensure that knowledge generated locally is made accessible to learners in schools so that they appreciate that knowledge generation is an indigenous activity in which they can become active participants.

In taking on the task of implementing the recommendations of the report¹, the Academy:

- Undertook a study of scholarly book publishing⁵ to complement the work on journal publishing. This report made a number of recommendations, some of which have recently been incorporated into the new guidelines⁶ of the DHET for research output recognition that apply from 2016. This study was also definitive in dealing with the elements of what constitutes a scholarly book and how these should be evaluated for the purposes of the output subsidy.
- Established the Committee on Scholarly Publishing in South Africa that advises the Council of the Academy on matters related to scholarly publishing and oversees the activities of the administrative unit within the secretariat of the Academy that is known as the Scholarly Publishing Programme.
- Established the open-access journal platform [SciELO SA](#) that is designed to be the premier collection of research journals from South Africa. From its establishment with the *South African Journal of Science* as its first journal to the current time with a collection of 60 titles, it has proved to be an excellent platform for enhancing the global visibility of research reported in these titles. Site visits have gone from 5000 in 2009 to 1.3 million in 2015. In addition, the SciELO SA platform has been included in the Web of Science Portal to allow for enhanced searching of the material in the collection.
- Transformed the *South African Journal of Science* into a fully open-access journal and the first to be available on the SciELO SA platform. The Academy took the bold step of pioneering the publication of this fully open-access journal to serve as a model to be emulated by other South African journals in the future.
- Publishes the magazine *Quest* as a means of making South African research activities accessible to a broader audience with the intention of luring young learners into research careers.
- Established and maintains the National Scholarly Editors' Forum that provides a platform for the editors of scholarly journals to get together and consider matters that need to be addressed in relation to the publishing environment in South Africa.

- Established and maintains the National Scholarly Book Publishers' Forum that provides a site for local book publishers to deal with matters of common interest.
- Established and continues to undertake a systematic discipline-based peer review of journals that are published in South Africa. Journals that are approved by this peer-review process may be asked to join the SciELO SA platform and the articles published in them are eligible for the output subsidy.
- Established and undertook a review of submissions from higher education institutions of books, chapters in books and conference proceedings in order to make recommendations to the DHET regarding awarding of subsidies. In this respect the Academy ensured that the assessment of submissions was undertaken by specialists within the disciplines of the authors and established what is considered to be a credible process of assessment.

This constellation of initiatives by the Academy provides for a rich environment in which scholarly publishing in a variety of modes can be pursued. The key elements of these initiatives are to ensure that scholars locally have a variety of vehicles through which to make their work known, to ensure that the quality of the work that is published is maintained at a high standard, both through the peer-review process for individual submissions as well as through the discipline-based peer review of groups of journals themselves, and to provide a platform for global visibility.

For the aspiring scholar of 2016, the demands that they face to obtain ratings from the NRF and to publish regularly as required by their institutions remain the same as for their predecessors at the turn of the century. However, the milieu in which they undertake their work has changed almost beyond recognition through the pervasive use of electronic means to communicate information and ideas, and the changing nature of publishing. They are beneficiaries of comprehensive interventions by the Academy to try to ensure that the quality of scholarly publication is maintained, but they have also been provided with an internationally recognised platform for the dissemination of work published in local journals. Apart from Brazil, South Africa is probably one of the few countries in which such a comprehensive set of interventions has been attempted in support of its scholarly community.



The other lesson of particular significance for the Academy is that the methodology employed to produce the two reports on scholarly publishing^{1,6} has been singularly successful in showing what can be produced by studies that have insightful analyses of the evidence, coupled with practical guides to policy development and implementation. The Academy has shown itself to be particularly adept at the implementation of the recommendations of the reports with the provision of a set of interventions that support scholarly activities.

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Science advisory role of national science academies

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Rising global interest in science advice

The celebration of the Academy of Science of South Africa's (ASSAf's) 20th anniversary presents an opportune time to examine ASSAf's role in the science advisory space in South Africa and to reflect, more generally, on the nature and value of academy advice. Although very young in comparison with other global science academies, some of which are more than 360 years old, ASSAf is fortunate to have benefitted from the experience of others and since its inception has had its science advisory role clearly articulated in its statutes. This is not true of many of the older science academies that were founded with the intention of fulfilling a largely honorific role and as such have had to grapple with the transition to a working academy model.

The topic of science advice is assuming a rapidly evolving and increasingly prominent role. The importance of science advice is commonly attributed to the scientific nature of the challenges confronting modern society – examples include climate change, disaster risk management, food security, and the bulk of the 17 Sustainable Development Goals. However, a defining moment in this newfound prominence must be attributed to the workshop on science advice hosted by Professor Sir Peter Gluckman, Chief Science Advisor (CSA) to the Prime Minister of New Zealand, under the auspices of the International Council for Science (ICSU) General Assembly in Auckland, New Zealand in August 2014. Further interest has been stimulated by the creation of the *International Network of Government Science Advice (INGSA)*, led by Gluckman.

Science advice has also been the topic of international meetings hosted by ASSAf. These meetings include the InterAcademy Partnership (IAP) General Assembly and conference hosted by ASSAf in February 2016 in Hermanus; the capacity building workshop on science advice for African scientists that was held as a pre-event to the IAP meeting; and a South African Young Academy of Science (SAYAS) event on youth perspectives on science advice to governments that was held in March 2016 alongside the IAP meeting. All these events have placed the spotlight on science advice and raised awareness amongst scientists and policymakers.

Science advisory ecosystem

A useful concept is that of a science advisory ecosystem, which accommodates a range of co-existing science advisory modalities, with individual models assuming varying importance in different countries, giving rise to ecosystems that may have quite different geographical expressions. Some of these science advisory modalities may include individual scientists, industry and/or business groupings, non-governmental organisations, science and technology committees, statutory bodies mandated to provide advice, government scientists, national academies and CSAs.¹

A variety of advisory structures is in place in South Africa, which include those listed above, as well as others such as advisors in individual ministries, sector-specific advisory bodies and early warning advisory bodies.² It is therefore not difficult to understand why in South Africa, the term 'crowded advisory space' is often used.

Here we focus on the role of science academies in this ecosystem, highlight the strengths of academy advice, give some examples from ASSAf's experience and reflect on how academy advice might evolve in the future in the South African context.

The academy's niche in the science advisory space is clearly carved out. Its strength lies in long-term, in-depth, evidence-based studies known in academy parlance as 'consensus studies'. Consensus studies are executed by a panel of volunteer members (not necessarily academy members/fellows). The panel members are selected for their knowledge and excellence in the field, their willingness to serve in a volunteer capacity and in the South African context, with due consideration given to demographic diversity. Consensus studies are a unique academy methodology, providing a multi-perspective, evidence-based view on a particular topic. Findings and recommendations are synthesised and published in a peer-reviewed report that is made available in the public domain.

ASSAf's experience in implementing consensus studies was gained from the United States National Academies during the African Science Academy Development Initiative (ASADI), which was a long-term capacity development initiative that introduced ASSAf to many such activities. It is acknowledged that the term 'consensus study' is troubling to some, particularly scholars in the humanities. However, the term should not be perceived as a notion that may stifle or constrain rigorous debate and argument, but rather as a means to distill core points of agreement that can provide policymakers with some degree of certainty about the complex world in which we live.

Addressing uncertainty in a complex, post-normal world

It is acknowledged that the complexity of the space in which science advisory bodies are operating can be overwhelming. This state was pointed out by Gluckman³ when referring to a post-normal world, characterised by uncertainty and stochastic phenomena. The need to reach consensus on key findings and recommendations in such complex situations is critical when giving advice to policymakers. At no time in our history has the need to identify the core been more urgent. Faced with an overwhelming amount of information and complexity, the role of academies in distilling the complexity into a finite number of evidence-based recommendations agreed upon by a panel of experts, is critical.

Challenges facing academies in giving science advice

Some of the challenges faced by academies in giving advice are those of relevance, timeliness and receptivity. If an academy-initiated consensus study does not align with the current needs of policymakers, it may be relegated to dusty bookshelves. This does not necessarily imply that only studies requested by government should be undertaken. On the contrary, it is expected that academicians will be sufficiently alert and practised in their fields that they will be able to identify emerging topics and embark on studies that will be useful to policymakers regardless of the genesis. Relevance also relates to the scope and focus of the study. The findings and recommendations must be precise, concise, targeted and useful. A related challenge is that of timeliness. Ideally, if the timing of a study is right, its relevance will be enhanced.

One of the biggest challenges is that of receptivity or country readiness for science advice. A report will have limited impact on policy if government is either unwilling or unprepared to receive the advice. Perhaps one of the best examples of this scenario is ASSAf's 2007 report *HIV/AIDS, TB and Nutrition*, which was published when the government at the time held alternative views about the cause of AIDS. The ASSAf report gained no traction in South Africa at the time, despite being lauded abroad as an example of a bold academy report seeking to present the scientific evidence. It is interesting to note that the full impact of this report was only experienced many years after its publication.

A second example is that of ASSAf's 2015 report *Diversity in Human Sexuality: Implications for Policy in Africa*, which drew some bold conclusions based on recent scientific evidence, and in so doing dispelled many myths surrounding human sexuality. The reception of this report in South Africa, which is known to uphold human rights of all persons regardless of sexual orientation, contrasted dramatically with its uptake in other African countries, 60% of which have legislation criminalising same-sex sexual conduct and some even have laws by which such conduct is punishable by death. Publishing an evidence-based report that challenges widely held belief systems underpinned by legislation takes courage. In this respect, the Ugandan National Academy of Sciences (UNAS) is to be commended for their courageous stance in the face of severe government opposition to the findings in the report. For ASSAf it was less of a reputational risk as the findings concurred with generally held views in the country. Exceptionally disconcerting, however, was the large number of science academies in Africa that refused to endorse the evidence-based report, in all probability because the evidence challenged official government positions or belief systems in those countries. Such a situation in which so few are willing to tackle a controversial topic and uphold the evidence base, does not bode well for academy advice in Africa.

Impact of ASSAf consensus study reports

To date ASSAf has conducted 19 consensus studies, all of which are available on the [ASSAf website](#). A question that is often asked relates to the impact and uptake of these reports. Recently, ASSAf has introduced a monitoring and evaluation framework and has begun to track impact, although it is acknowledged that this is a complex undertaking that is still in its infancy. Some examples of a direct policy influence of ASSAf's reports are listed:

- The 2006 *Report on a Strategic Approach to Research Publishing in South Africa* and the 2009 report *Scholarly Books: Their Production, Use and Evaluation in South Africa Today* had a major influence on the Research Output Policy of the Department of Higher Education and Training (DHET) that was published in 2015 and implemented with effect from January 2016. Recommendations from each of these reports have been incorporated into the DHET policy, specifically those relating to quality, peer-review practices, subsidy units allocated for books, and the inclusion of [Scientific Electronic Library Online \(SciELO\)-SA](#) as an index for automatic accreditation of South African scholarly journals.

- The findings and recommendations of the 2010 report, entitled *The PhD Study*, were used by the Council for Higher Education as a basis for discussion when revising the Higher Education Qualifications Framework. The report recommendations were also implemented by the Department of Science and Technology, DHET and the National Research Foundation.
- The 2009 report *Revitalising Clinical Research in South Africa* led to announcements by the Minister of Health regarding increased health research funding and a website has been developed to raise awareness about and promote clinical research in South Africa.

Limitations of science advice in the policymaking process

Policy is rarely determined by scientific evidence alone. It is contended that to some extent the provision of advice may be viewed as separate from the policymaking process. The advice that is given should be based on the best available information which underpins objective conclusions and recommendations to policymakers. That a policymaker may elect on occasions not to follow the advice given must be acknowledged. There may be many competing and compelling considerations that have little to do with the scientific evidence, such as financial constraints, public opinion and political obligations. Gluckman³ therefore prefers the term evidence-informed policy as opposed to evidence-based policy.

Advice versus advocacy

Advocacy differs from objective, impartial science advice in that it reflects the interests and/or value systems of the party providing the information. Ideally, the body providing advice in this instance should be transparent about their bias and how it may influence the conclusions reached; non-governmental organisations typically fall into this category. Such responsible, science-based advocacy differs from science advice but may still have a place.¹

Straying into the advocacy terrain is dangerous for academies. At the heart of academy advice is the reputation for honest, objective, unbiased advice. Damage to these core attributes would place the advisory function at risk and render academy advice questionable.

Confidentiality of science advice

There is certainly a need for confidential science advice, but this is not a role that is or should be fulfilled by academies. Academy advice is valued for its transparency; all ASSAf's science advisory reports are published and available in the public domain. Arguably there are other bodies that are more suited to this type of science advice and the distinction between such bodies and academies in respect of their science advisory roles should remain – further strengthening the notion of a science advisory ecosystem and a distinct but synergistic role for all the ecosystem components.

ASSAf's role in science advice in the future

The two main bodies mandated to provide science advice in South Africa – ASSAf and the National Advisory Council on Innovation (NACI) – have each defined their niche and form part of the science advisory ecosystem in the country. The former focuses on long-term, in-depth studies as described above and the latter on shorter timescale studies of the order of a few months and produces concise briefs for the Minister of Science and Technology. There is a gap at the very short end of the temporal spectrum, when advice is required on a timescale of the order of days or weeks.

It is generally acknowledged that academies are not good at providing rapid response advice. The question might then be posed as to who is best positioned to give rapid response advice. Certainly, a CSA can play a critical role and in times of disasters or emergencies may even become part of the decision-making team as noted by Gluckman³. However, even a CSA is unlikely to possess all the expertise required at a time that rapid response advice is required and would likely depend on advice from a network of experts in such instances. It is contended that in the absence of a CSA in South Africa, ASSAf should assume this role. Academies

are renowned for their convening capabilities, largely expressed through the hosting of workshops and symposia. Yet, there is nothing preventing this experience and proficiency from being exercised in a shorter time frame; the same network of national and international experts could be convened electronically or telephonically and either collectively or individually, to seek advice in such situations. Currently, in South Africa, neither ASSAf nor NACI is active in this advisory space. A role for ASSAf should be explored.

Final reflection

Notwithstanding the fact that ASSAf's role as a science advisory body is enshrined in the *ASSAf Act*, it is incumbent on ASSAf to mould and establish this role such that its advice is highly respected and sought after. The fundamental tenets of academy advice, essentially objective,

evidence based, free of vested interests, based on volunteerism and multi-perspective, must be cherished and protected as ASSAf matures in its role in the science advisory ecosystem in South Africa.


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Finding an influential voice for academies in Africa

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Scholarly academies have been in existence for about 350 years, with the oldest being those that were established in Europe in the 17th century. These institutions consist of groups of individuals who are elected by their peers to be members (often called fellows); since the middle of the 19th century, election to the august ranks of most academies has been based on recognition of the outstanding scholarly work done by those proposed for membership. Academies have made the transition from being learned societies to being select groups of eminent scholars who are often widely admired in their countries.

The transformation of academies into institutions that have the most eminent scholars of a nation as their members, meant that they became influential in advising their national governments and were regarded as a unique source of expert advice in matters of national concern. However, this has not always been the case in the history of European academies and often is not the case for more recently established academies in other parts of the world, particularly in Africa. Lorna Casselton, a former Foreign Secretary of the Royal Society of London pointed out somewhat acerbically, 'My post was instituted in 1723, nearly 60 years before the British government appointed its first Secretary of State for Foreign Affairs', making the point that academies were transnational in their reach long before governments formally established offices to deal with international relations. Academies engage with a global community of scholars whose interests are aligned primarily with their disciplines and only secondarily with their national origins. Governments have often been slow in understanding the value that academies have in providing advice. A good example of this is the publication by the Academy of Science of South Africa (ASSAf) of the report *HIV/AIDS, TB and Nutrition* (2007) which, although not accepted initially, had a significant impact through providing a basis for a radical change in national policy for the treatment of HIV/AIDS.

The use of independent academies to provide advice on matters of public interest is of significant benefit to governments when they are confronting difficult political and technological choices. However, the degree to which this advice is solicited and then subsequently used depends on the nature of the government in place and their assessment of the political risks associated with accepting independent, impartial advice.

With the exception of the US National Academies of Science (USNAS) that was established by Abraham Lincoln to offer advice to Congress on matters of science and technology, most academies started out their lives as learned societies that were largely honorific in their function. The rigour with which their members are chosen, meant that there was significant prestige associated with election to these bodies. However, academies did not conceive of themselves as reviewing matters of national importance based on the best available evidence with a view to providing informed insights for policy development by governments. This latter role has developed and accelerated over the course of the 20th century, as technological advances and growth of human populations have placed increasing strain on natural resources, thereby requiring governments to make policy choices in relation to highly technical matters. The range of expertise that academies can bring to bear on the assessment of these problems through their membership is unique and valuable, if appropriately used.

The key element that makes academies valuable as sources of multi-perspective advice is their independence in two important respects – they are governed by councils that are elected by their members and they have a professional secretariat appointed by their councils.

As a subset of the global family of academies has re-conceptualised their role as outlined above, they have realised the necessity to establish networks of academies in order to address issues that are of regional or global concern. The InterAcademy Panel (now IAP for Science) that is the global network of science academies was established in 1993 in order to assist with the coordination of the activities of national academies on a global scale. It now has 107 member academies and plays an important coordinating role in matters that are of global concern by convening meetings of its member academies and by facilitating the establishment of regional academy networks to deal with specific matters at a regional level.

In the case of Africa, although some academies have been in existence for over a century, most have a much shorter history associated with the timing of their country's liberation from their colonial governments. Conceptualising a role beyond the honorific one by these academies has been a recent phenomenon that is still in the process of being formally established.

A successful advisory role for academies is dependent on three conditions: they need to be seen as offering independent advice which is not partisan, they need to have well-established methodologies for providing advice that is robust and establishes confidence in the reports that are produced and, finally, they need to have a government and civil society that is potentially receptive to the advice.

Based on this short exploration of the history of academies, I can now turn to ASSAf – the *Academy of Science of South Africa* – and put its development in the context that I have sketched. ASSAf was inaugurated in 1996 at a gala dinner hosted by then President Nelson Mandela who acted as the patron of this newly established academy. The key point about the launch of ASSAf was that it conceptualised itself *ab initio* in a way that was not common for academies – it had the traditional role of honouring those who were elected to its membership, but it also defined for itself an activist role of using science for the benefit of society.

Between 1996 and 2001, the Members of ASSAf were in discussion with the officials of the Department of Science and Technology (DST), actually the Department of Arts, Culture, Science and Technology at the time, to get an Act passed by parliament to establish ASSAf as a statutory body. This was finally done in 2001 and ASSAf came into being as the national academy of science in May 2002. During this period, ASSAf was largely pursuing the honorific

role that was the key element that gives academies their strength and their substance – the expertise and standing of their members.

With the establishment of ASSAf as a statutory body, it entered a new phase of development during which a professional secretariat was established and an executive officer appointed. The first Executive Officer, Prof. Wieland Gevers, was instrumental in giving ASSAf an institutional identity through the writing of the regulations that govern its activities and in giving substance to the work of the secretariat. Indeed, he translated the activist aspirations of this nascent academy into action through the initiation of the first study that ASSAf undertook: *Report on a Strategic Approach to Research Publishing in South Africa*. This report was commissioned by DST, and when completed was welcomed both by that department and the Department of Higher Education and Training (DHET) because its recommendations provided a basis for quality assurance of journals published in South Africa and provided DHET with recommendations for a more reliable basis for evaluating the research publications produced by universities.

ASSAf's ability to have an impact in influencing government policy was given a very significant boost through being one of the academies included in the African Science Academies Development Initiative (ASADI) that was initiated by USNAS with funding from the Bill & Melinda Gates Foundation. The programme provided funding for 5 years and also involved intensive mentoring of the staff of the ASSAf secretariat by the staff of USNAS. During this period, the way in which ASSAf provided advice to government and other organisations, evolved to the point at which a range of instruments was deployed to provide advice in different situations.

The other important element of the ASADI programme was that its annual meetings provided a platform for the expansion of the Network of African Academies of Science (NASAC) that was established in 2001 with ASSAf as one of the founding nine members. At the conclusion of the ASADI programme in 2015, NASAC had grown to include 21 African academies of science and had instituted a range of programmes that

fostered both academy development and the collaboration of member academies in a range of studies including addressing the issues of the use of scarce water resources and maternal and child health.

The real challenge facing NASAC and its member academies is the way in which they will be able to influence governments in Africa and the pan-African organisation, the African Union (AU), to address the Sustainable Development Goals and achieve the AU Commission's *Agenda 2063* aspirations. Up to this point, their role in these discussions has not been central, but they will need to conceptualise ways in which they will be able to achieve a much greater level of influence over the coming decade because ambitious targets – 'no poverty' and 'zero hunger' – have already been set for 2030.


Working in their own national environments and collectively as members of NASAC (the affiliate network of the IAP for Africa), the African academies of science will need to generate a set of credible interventions and recommendations that will assist governments and the AU to achieve their goals. Goal setting of this kind can be depressing if the goals are not achieved, but the achievement of the goals would lead to a level of well-being in the countries involved that would be its own reward.

At the beginning of this piece, I posited three requirements for a modern academy to be successful: the first was that the advice should be seen to be impartial, the second was that the academy should have an armoury of instruments that could be used to generate advice and the third was a government and civil society that was receptive of advice. I believe that the first two requirements are already in place for most of the African academies of science thanks to their participation in the activities of NASAC. The third remains somewhat problematic, as this is an area in which the academies and their members need to use their influence in order to ensure that their recommendations and statements are taken seriously. This can only be achieved by an ongoing engagement with the individuals and institutions that need to be influenced – ensuring that the voice of the academies is heard not only in the national context, but also on regional and continental scales.



ASSAf and young scientists: Transforming the future of science in South Africa

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Many academies globally interact with young scientists (viewed here as all those who have just completed postgraduate studies to mid-career scientists) only on an ad-hoc basis through prizes or once-off engagements. This substantial group of active knowledge producers is often not treated as a core part of the scientific community or as leaders who could shape science and society – despite the fact that they often drive new developments, and will be the leaders of the scientific community in as little as 5–10 years. It is often argued that they should be spending their time ‘in the lab’ and writing grants and papers, rather than busy themselves with the type of engagement and policy work that academies typically undertake. Consequently, the voices of the next generation of science leaders are often silent in policy discussions, even when the policy is about young scientists or about the future of science. It is thus not surprising that a recent special feature in *Nature* concluded: ‘Academia is more difficult than ever for young scientists. That’s bad for them, and bad for science.’¹

This paradigm of interaction between academies of science and young scientists is changing in South Africa, thanks to visionary leadership in the Academy of Science of South Africa (ASSAf) over the last few years. ASSAf today is amongst the most active academies globally in their efforts to promote young scientists. There is no other body in South Africa that is currently doing more to provide platforms for their interaction and engagement, and to give a voice to this critical part of the science community.

While ASSAf has had a focus on recognising and supporting young scientists through annual Young Scientists’ prizes together with The World Academy of Sciences (TWAS), the Department of Science and Technology or the African Union, and the Sydney Brenner fellowship, it has also developed a range of dedicated programmes over the last 6 years that touches a large cohort of young scientists across the country. Here I highlight some of the most significant of the activities through which ASSAf has supported young scientists.

International networks and platforms

A critical role that ASSAf has played for young scientists is ‘upward connection or mentorship’, by opening doors to top quality networks and organisations internationally. As an example, I first interacted with ASSAf in 2009 through a joint programme with the IAP: Global Network of Science Academies to send young scientist representatives to the annual World Economic Forum (WEF) meeting in China. As a direct result of this coming together of a global cohort of young scientists, which also included other South African scientists thanks to ASSAf, the *Global Young Academy* was launched in 2010. Soon after, the South African Young Academy of Science (SAYAS) was launched in 2011. In this way, ASSAf has ensured that a number of South African scientists have the opportunity to be involved at the forefront of stimulating the global Young Academy movement, which is now established in 23 countries, and with many more in development. South African young scientists continue to benefit annually from interaction with other young scientists from across the world at the WEF annual meeting in China, but also through linkage to various other global platforms, such as networks of academies of science, the Lindau Nobel Laureate meetings, international science fora, the International Network of Government Science Advisors, and many more.

ASSAf’s influence extends beyond South African young scientists, through the large number of South Africans who have been involved with, and who have led the Global Young Academy, including hosting its second annual conference in South Africa in 2012. This reach is also particularly relevant in Africa where these fellows have been key partners to other Global Young Academy members in supporting the establishment and growth of other national young academies, including involvement in the *Africa Science Leadership Programme*, African Science and Society meetings, and continent-wide National Young Academy meetings (including one just completed in Mauritius), to name but a few.

Local networks and platforms

At a national level, ASSAf has been the key supporting organisation for the establishment and development of SAYAS. Following initial calls for support for this process, ASSAf convened a small committee of young scientists to drive the process; realising from the start that this process needed to be ‘bottom up’ and not ‘top down’. ASSAf has continued to engage with SAYAS as an autonomous body. SAYAS operates independently from ASSAf, with a Memorandum of Understanding guiding their active and positive approach to partnership and engagement. Following the launch of SAYAS, ASSAf has also provided a physical home and administrative support for SAYAS through a shared appointment of a Liaison Officer. ASSAf also manages core funding to SAYAS from its parliamentary grant. As an active participant in management structures of SAYAS, I can attest to continuous and critical support from ASSAf without pressure or interference for the work and views of the members of SAYAS.

Such initiatives matter, not only for the individuals involved, but for young scientists in general in the country. Today SAYAS is the premier platform that provides ‘a voice for young scientists’ in South Africa, and that serves as a point of interaction with other young academies around the world, and with formal structures of government and science.

Young scientists are often best to serve as mentors and role models for other young scientists and school learners. By creating and supporting young scientist structures that can advance such goals, the impact of ASSAf reaches much further than the formal structures and programmes described above. For example, SAYAS is participating in projects such as ‘1000 Girls, 1000 Futures’, science spazas that support and develop science clubs in underprivileged schools, studies on the experience of young scientists in South Africa, a PhD blog through which

students describe their journey through their PhD, and more. These projects reach cohorts of young South Africans that ASSAf would not have been able to do on its own.

An apt illustration of the unique interaction and perspectives that ASSAf and SAYAS bring are the recent statements from these organisations about the #FeesMustFall related events on campuses across the country. At the height of this crisis, with campuses being closed or engrossed in protests, there was a growing desire for these academics to give a perspective as the biggest collection of academics representing all institutions. The *first statement* was issued jointly from both organisations and captured a core message of concern and an offer to contribute towards solutions. While it was authoritative and strong, the statement could not address some of the more contentious issues. Soon thereafter at the General Assembly of SAYAS, the young scientists felt that there were further – and more specific – issues they wanted to address, and so issued a *second statement*. Together these two statements capture a richer perspective of the views of South African academia, and contribute to a more nuanced ‘voice of scientists’.

Since 2010, ASSAf has hosted an Annual Young Scientist Conference, in partnership with the National Research Foundation, Department of Science and Technology and SAYAS. At these conferences, ASSAf has brought together a broad range of young scientists from across Africa to network and present their work to peers in a truly interdisciplinary setting. Importantly, these conferences have addressed a range of topical issues, from biodiversity, to the role of science in empowering women in Africa and, most recently, human rights. By engaging young scientists on these topics, ASSAf has impacted more than a 1000 future leaders in science. There is no doubt that these intersections and engagements will have deep and lasting impacts on the sensitivity and activism amongst the future leaders of the scientific community on these issues.

SAYAS and other young scientist engagements are important vehicles for ASSAf to promote diversity and transformation in the South African research community. Through this active engagement with young scientists from all institutions and groups in South Africa, and with a specific focus on underrepresented groups, ASSAf is providing the exposure and opportunity for a truly representative cohort of future leaders of science in the country to emerge.

Young scientists and ASSAf publications

ASSAf has an important national role as a custodian of key scholarly publications and in overseeing publication platforms. Herein lies opportunities to further engage meaningfully with young scientists. The *South African Journal of Science* has been an outlet for members of SAYAS from early on. Other than research articles, SAYAS members have been able to raise their voice through opinion articles on a variety of topics, from the reflections on science’s role in sustainable development², to the research experience of young scientists in the country³.

This is a feature that ASSAf can help enhance in future, possibly via a dedicated ‘Future Voices’ collection of opinion pieces on a regular basis (as *Science* does every few months through their Next Gen Voices feature). SAYAS inaugurates 10 new members every year – short opinion

pieces from each of these leading young scientists on key developments in their field, especially giving a South African or African perspective, or on other topical issues (e.g. the impact of #FeesMustFall) could add rich insight into the direction of science development in the country.

Young scientists are also actively involved in another of ASSAf’s publications, *Quest*. This high-quality ‘popular science’ magazine provides an ideal outlet for SAYAS to promote a closer interaction between science and society, which is one of its core objectives. *Quest* has covered numerous articles about the work of SAYAS members in the past 5 years. This relationship too could be explored even further through dedicated features, for example, by linking to the PhD blog run by SAYAS or by specific partnership during activities run by SAYAS.

Transforming the future

At 20, ASSAf is a young academy compared with many around the world. The next 20 years of its development will no doubt be directly influenced by the work it started amongst young scientists in the last few years. SAYAS members are already actively involved in various structures of ASSAf, providing a fresh perspective in standing committees and other structures. The pool of experienced young scientists from which to draw for these functions will continue to grow in coming years. This is an important outcome of ASSAf’s efforts, especially in the light of the fact that such a resource was not available even 5 years ago.

Furthermore, the first SAYAS alumni have recently been incorporated into ASSAf (although this is not an automatic process), and we are likely to see a steady increase in such ASSAf members over the next few years. By the next 20-year mark, a substantial group within ASSAf is likely to have been members of SAYAS. These new members will bring with them experiences of different approaches from their involvement with young academy activities. Moreover, they represent a network of transformation-minded science leaders, ready to work with the ASSAf structures to engage society, our scientific community in South Africa and beyond.

Over the last few years, ASSAf has laid a foundation for the promotion, engagement and capacity development of young scientists. If these activities and platforms are supported (and expanded) into the future, they have the potential to transform the research landscape in South Africa, through a more engaged, representative and transformation-minded scientific community.

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