

## Executive Summary

The African Science Academy Development Initiative (ASADI) was launched in 2004 and ends in early 2015. It received funding of \$20 million from the Bill & Melinda Gates Foundation, and smaller sums from other partners.

It was intended to enhance the capacity and influence of academies of science in selected African nations by building the scale and expertise of their secretariat and infrastructure, increasing their capacity to provide evidence-based policy advice, improving their fundraising and communications skills, and expanding the involvement and expertise of their council, officers, and members.

ASADI provided primary support for five African science academies, those of Cameroon, Ethiopia, Nigeria, South Africa, and Uganda, considered intensive partners, and lesser levels of provision for the academies of Ghana, Kenya, and Senegal, and for the African Academy of Sciences.

The task that ASADI took on was a large and difficult one. It is therefore commendable that it was funded generously, and over the unusually long period of 10 years.

### REVIEW OF ASADI'S FORMAL OBJECTIVES

This end-stage review of ASADI, undertaken by the InterAcademy Council between October 2013 and October 2014, had two purposes (the full statement of task for the review can be found in Appendix G). One was to assess whether ASADI had met all the targets it was set, as described on page 12. This aspect of the review focused on the “output and outcomes” of investments in the five intensive partner academies and the impacts of the annual meetings. The panel found that ASADI has met its objectives and milestones, and must be regarded as a success. Important quantitative metrics for staff training and for the production of consensus reports of policy value were both met and exceeded.<sup>1</sup> ASADI aimed to grow the academies’ abilities to be effective, objective sources of evidence-based policy advice, occupying a unique civic space in their respective societies. There is no doubt that this growth has occurred.

The panel was also asked to draw “lessons learned” about the capacity-building process from the perspectives of both the ASADI board and staff, and the participating academies. In addition, the statement of task asked the panel to “capture relevant insights regarding the methods employed by the ASADI program, sustainability, and future initiatives to maintain and expand built capacity.” From this starting point, the panel drew on the information gathered during the review to formulate wider conclusions and develop recommendations about the future shape of science academies in Africa, the organization of African science policy and independent science advice, and future academy-related capacity-building. The conclusions and recommendations are intended to inform action in both the developed and the developing world.

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<sup>1</sup> Consensus study reports involve the consideration of primary and secondary evidence on a policy question or issue by a panel whose members collectively possess the expertise needed to address the question or issue. Depending on the issue, panels may include non-academy members. In general, members of science academy consensus study panels serve as volunteers. Panel deliberations lead to a set of evidence-based independent recommendations to government and other stakeholders based on a consensus of the panel.

The panel did not conclude that ASADI was a flawless project. It sometimes failed to consider the African context for scientific advice to government. Its U.S. managers, while dedicated, were sometimes overly prescriptive and capable of seeming overbearing to their colleagues in Africa. The U.S. staff for their part had frustrations with the academies on occasion, for example with missed deadlines. And because of the Gates Foundation's interest in health, much ASADI funding was devoted to this important, but focused policy area. Academies sometimes found this restricting. However, most of the ASADI intervention was generic in nature and has benefitted academies across the full range of their activities.

The panel also found that it was often impossible to attribute a specific change in one of the ASADI academies to ASADI itself. ASADI lasted for a full decade and the academies would have developed over that period even if ASADI had not existed. The panel has tried to make this attribution, but this process is inherently not perfect. For example, the point was made to the panel that ASADI funding gave academies the confidence to try new initiatives, even though these would not be regarded as an ASADI intervention.

## **STRENGTH IN DEPTH**

ASADI's own objectives were:

1. Develop partnerships with African academies of science;
2. Train approximately 30 African academy staff members to conduct policy advisory studies and manage finances;
3. Develop in each partner academy a forum for convening stakeholders for discussion and debate of evidence-based policy development in cross-cutting areas of health and sustainable development;
4. Complete at least 18 policy advisory activities in areas impacting African health and sustainable development;
5. Provide upgrades to the human and material infrastructure of participating science academies;
6. Develop an alliance of African science academies through nine annual regional symposia and collaborative workshops; and
7. Complete interim and final evaluation reports, which will summarize lessons learned and make recommendations for future capacity building activities.

The panel finds that all of these objectives were met and exceeded. Fuller details are provided in chapter 2 of this report. But, for example, at least 70 people received training against a target of 30, and at least 29 policy advisory activities were completed against a target of 18.

Having satisfied itself that ASADI had fulfilled the criteria set out for success at its launch, the panel went on to examine seven other criteria on which the success of ASADI could be judged.

### **Organizational Capacity**

The review showed that the ASADI academies have succeeded in building their organizational capacity substantially, in terms of staff numbers and skills. An example is their improved capacity for financial management.

## **Financial Stability**

The financial stability of the academies itself has grown with the addition of new funders, mainly government, but also private and foundation supporters. However, financial and personnel stability remain as long-term issues for all academies. New forms of finance are especially important because ASADI itself became a principal source of income for the five main academies it supported

## **Capacity for Strategy Development**

Strategy development helps with academy thinking, planning, and execution, and helps other institutions to be effective partners for them. It also allows metrics of academy success to be developed and monitored, a measure whose adoption the panel supports. All the academies are now users of strategic planning, and track progress against their plans over time.

## **Engagement with Government**

These expanded assets, both human and financial, have allowed the ASADI academies to expand their interactions with government. Many are now trusted advisers to ministers, parliamentarians, and ministries in areas such as health, food and nutrition, biotechnology, and the environment. Their advice is sought in areas such as innovation, education, health policy, disease prevention, and poverty reduction. ASADI also found progress in areas such as the public communication of science, although these were less central to ASADI than the academies' policy role.

## **Overall Production of Outputs and Activities**

These academies now undertake a broader range of activities. These include work with young and women scientists, public engagement, and popular and scholarly science publishing. These activities have expanded their reach in the community beyond that available to a traditional honorific academy. A specific welcome move is the support for Young Academies and other activities championing involvement of young scientists. Young Academies recognize future scientific leaders, and allow science to show a more diverse and representative face to the nation of which they are part.

## **Engagement of Members**

Of the seven criteria adopted by the review panel, progress here was the most mixed. The larger academies, for example in South Africa, are well-resourced and are careful to involve members in their work. Others operate on a more modest scale, for example in Cameroon, and are crucially dependent on a small group of key people. The panel noted too that these academies, like others around the world, have a continuing struggle to diversify the age, gender, and race structure of their membership.

## **Regional and Global Engagement**

The panel also noted with approval that despite its U.S. origin, ASADI has led to an increased level of support and dialogue among academies in Africa in areas such as training and skills sharing. This has included help for groups of scientists setting up academies in nations where none exist.

## **LESSONS LEARNED**

Many developing nations have less capacity than their developed counterparts for generating evidence-based policy advice. ASADI's original and correct insight was that academy development was a direct means of strengthening this capacity and enhancing informed decision-making in African nations.

The review finds that there is a sharp division between the academies of Nigeria and South Africa on the one hand, and those in Cameroon, Ethiopia, and Uganda on the other. The first two are comparatively large and well-resourced, and are based in the continent's biggest economies. They have "graduated" from ASADI and are regarded as capable of further self-driven progress. The other three are far smaller.

The review also finds that academies vary in their legal status and relations with government. Not all of them are recognized through legislation, and not all have guaranteed core funding from government. These are both necessities for a sustainable and independent academy. In addition, not all of the ASADI-supported academies have their own buildings and equipment. These resources are essential if academies are to operate in a credible and independent manner.

It also finds that some smaller academies need to develop their internal planning and strategy processes, including their use of quantitative measures of progress. As well as enhancing their internal functioning, this will allow them to become more effective partners and funding recipients, by making it simpler for supporters to see what return they will make on their investment in academy activity.

## **BEYOND ASADI**

The panel found that a system of support for developing African science academies is still needed. Several northern academies, for example in Germany, the Netherlands, the United Kingdom and the United States, regard this activity as part of their mission. The global inter-academy organizations might also play a constructive role.<sup>2</sup>

The panel welcomes these links, and the involvement of other developed country academies in helping to build African academies of science. However, it concludes strongly that a possible successor to ASADI should as far as possible be shaped and delivered within Africa.

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<sup>2</sup> The global inter-academy organizations are the InterAcademy Council, IAP – The Global Network of Science Academies, and the InterAcademy Medical Panel. These three networks work closely together, and during 2014 formed an umbrella organization – the InterAcademy Partnership – to better integrate their programs and operations going forward (see [www.interacademies.org](http://www.interacademies.org)).

The outline of how this might be accomplished has become clearer during the period of the ASADI program. The academies of Uganda, Nigeria, and South Africa have emerged as regional leaders in East, West, and southern Africa, respectively. This allows us to imagine a structure for academies in Africa to support each other with resources such as training, skills, and equipment.<sup>3</sup>

In addition, the panel sees a clear need for more active continental-scale representation for African science. This might involve enhancing the Network of African Science Academies (NASAC)<sup>4</sup>, the coordinating body for the African science academies<sup>5</sup> including its member, the African Academy of Sciences (AAS)<sup>6</sup>. These bodies need more resources and a bigger role, for example in dealings with the African Union, the New Partnership for Africa's Development, the United Nations (UN) and related organizations, national governments in and beyond Africa, the global scientific community, and possible donor bodies. African and global policy development; implementation; monitoring and evaluation around issues such as the UN's Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs); and disaster risk reduction would benefit from stronger scientific input. It is a strong conclusion of the review that there is now a substantial gap in African science organizations that needs to be filled. Any follow-on to ASADI should regard this as part of its remit.

In order to develop the capacity for such action, African academies will need to become more effective at raising new resources. The current growth rates of many African economies suggest that this task might be less problematic now than in the past. However, fundraising is a lengthy process which involves convincing donors of the value of their investment, maintaining dialogue with them, and reporting back effectively. This creates a major new task for academy staff and council members, who may already have full schedules. It also emphasizes the need for academy presidents to be prestigious figures who are willing to make a significant time commitment to the post. The same applies to the issue of academy endowments. An endowment generates income that helps guarantee academy stability and independence, but few academies in the developing world now have endowments of a worthwhile scale. Their development will be an important, but lengthy task.

New funding is also important if academies are to develop new roles. The ASADI-supported academies are already involved in engaging the public with science, in publishing both

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<sup>3</sup> This is not meant to exclude other academies from playing regional leadership roles, such as the Cameroon Academy of Sciences in Central Africa and the Ethiopian Academy of Sciences in East Africa.

<sup>4</sup> The Network of African Science Academies aspires to act as an independent African forum that brings together academies of sciences in Africa to discuss scientific aspects of challenges of common concern, to make common statements on major issues relevant to Africa, and to provide mutual support to member academies. NASAC member academies includes 19 African science academies, namely; Academie Nationale des Sciences, Arts et Letters du Benin (ANSALB), Academie Nationale des Sciences et Techniques du Senegal (ANSTS), Academy of Science of South Africa (ASSAf), Academy of Sciences of Mozambique (ASM), African Academy of Sciences (AAS), Cameroon Academy of Sciences (CAS), Ethiopian Academy of Sciences (EAS), Ghana Academy of Arts and Sciences (GAAS), Hassan II Academy of Science and Technology Morocco, Kenya National Academy of Sciences (KNAS), Madagascar National Academy of Arts, Letters and Sciences, Mauritius Academy of Science and Technology (MAST), Nigerian Academy of Science (NAS), Sudan National Academy of Sciences (SNAS), Tanzania Academy of Sciences (TAAS), Togolese Academy of Sciences, Arts and Letters (ANSALT), Uganda National Academy of Sciences (UNAS), Zambia Academy of Sciences (ZaAS), and Zimbabwe Academy of Sciences (ZAS).

<sup>5</sup> In this report, "African science academies" and "African academies of science" refers to the ASADI-supported academies as well as the non-ASADI-supported academies, and includes the African Academy of Sciences.

<sup>6</sup> The African Academy of Sciences is an Africa-wide individual membership-based scientific organization, with a view to honoring internationally renowned African scientists and to encourage the development of the research and technology base throughout Africa.

research-level and popular scientific literature, and in representing science to audiences such as educators and industrialists. But there is scope for vast growth in these activities.

At the same time, these academies still need to deepen their all-important policy links to government. Experience in nations across the world shows that connecting the worlds of science and policy is always difficult, because of their differing timescales, expectations, and vocabulary. Over time, however, a positive experience of science academies may make governments more willing to listen to the advice they provide, and the panel has seen early signs of success in this field among all the ASADI-supported academies. As a number of experts told the review group, positive policy links to governments in Africa will involve a different model for policy advice from the developed-world approach, which implies a broad degree of separation between the party offering the advice and the one receiving it. Instead, many African political systems are more tolerant of closer relationships in which an individual might play more than one role.

The five principal ASADI supported academies have made tremendous progress. They are already important bodies within their own countries and beyond. For example, the review team was told by the Ethiopian government that the very existence of the academy there was a sign of national prestige. The panel looks forward to a future in which the academies can take this success to a higher level.

**Box ES-1 Appreciation**

The panel gathered an immense amount of input material from the ASADI partner academies, from the U.S. National Academy of Sciences and the U.S. Institute of Medicine, and from external experts in government, universities, non-ASADI academies, and other settings. This involved extensive interviews, used in the report anonymously, and the provision of many records and documents. The panel is grateful to everyone who made our task possible.

## CONCLUSIONS

Conclusion One: ASADI has been a significant success—both in terms of meeting its stated objectives and in its wider positive impacts on the trajectory of the African science academies that it supported. Of the specific areas of capacity building that the panel reviewed, the training and financial support that strengthened academy secretariats and assistance to improve strategic planning were the most notable. The ASADI-supported academies are making significant contributions to their societies. They are vital civil society organizations that can expand their contributions to health, development, and evidence-based policy making. ASADI has helped to expand the scale of this contribution markedly.

Conclusion Two: Although strengthening the African science academy movement on a continent-wide basis was not a primary goal of ASADI, some aspects of the program have had this effect. Most notable was support for the Annual Meeting of African Science Academies (AMASA)<sup>7</sup> and

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<sup>7</sup> Each year, since the inception of the ASADI program, an annual meeting of ASADI partners, later expanded to include other non-ASADI-supported science academies on the continent, has been held to encourage collaboration and joint learning among Africa's science academies.

for collaborative studies on issues such as discouraging tobacco use. The dialogue and relationships that have been built among African academies represent a significant asset that can be used going forward.

Conclusion Three: The ASADI-supported academies are building and pursuing several different models for what an African science academy can and should be. Developed country academies can provide useful examples and advice, but close emulation may not always be possible or desirable. The ASADI process clarified the elements necessary for a science academy to be effective in serving society, which can be used as a template for future efforts to build the capacity of academies. These elements include a critical mass of excellent scientists that constitutes the membership; the ability to recruit, train, and sustain an outstanding staff; strong leadership by the council and executive secretary; facilities and infrastructure that enable the academy to work effectively; political backing, including recognition by an act of the legislature; and later in its development, diversified sources of funding (project vs. core; government vs. other stakeholder), and communications and media relations capability.

Conclusion Four: ASADI did not always go smoothly, and experienced its share of tensions and missteps. In the end, these did not seriously impair the program's overall effectiveness. Some of these difficulties, such as occasional disagreements between the U.S. National Academy of Sciences program staff and the African academies over control of resources and their use, might be unavoidable in a program of this type. Other issues hold lessons that are relevant to future efforts to build the capacity of science academies in Africa and elsewhere. For example, the national policy context as well as resource needs should be taken into account in setting goals for the types of products an academy should be generating. Early on, ASADI focused on enabling the partner academies to produce consensus study reports. While consensus reports are valuable, the greater openness to different sorts of products that ASADI has exhibited over time encouraged the African academies to develop innovative new mechanisms for serving their governments and broader societies.

Conclusion Five: Despite the success of ASADI, the academies that it supported face a variety of challenges in sustaining the capacity that has been built and in becoming more effective and influential. A significant source of resources for supported academies will end with ASADI. In addition to financial challenges, the academies will be pressed to increase their policy impacts, expand outreach to society, retain staff, and strengthen their membership bases. Most of the ASADI-supported academies are vulnerable to the loss of key personnel. There is a continued need for capacity building among African science academies and in regional and continent-wide institutional infrastructure. Donor support for such capacity building would be an excellent investment in strengthening African civil society, promoting the effective governance of African nations and finding evidence-based solutions to the continent's most serious problems. Future academy development will call for priorities to be set and choices to be made, given that in practice, resources will continue to be finite.

Conclusion Six: In order for the broader African science academy movement to advance more rapidly, which will benefit both African science and African society at large, there is a pressing need to strengthen the institutions and activities that support academies and foster collaboration at the continent-wide and regional levels.

## RECOMMENDATIONS

Based on the information that it gathered during the review, and informed by the experience of its members, the panel has developed several recommendations for African science academies and other stakeholders. The recommendations are aimed at outlining a pathway toward continued growth, greater financial sustainability, and increased policy influence for individual academies and for the broader African science academy movement. Unlike the assessment of ASADI's results against its stated objectives, quantitative measures and other data were of limited use in developing these recommendations, which by necessity involved the collective judgement of the panel members. The panel believes that African science academies can perform extensive and valuable service for their societies in the coming years. They have the potential to be recognized as strong, independent institutions, built upon the scientific merit of their fellows, and acting as beacons for science and technology as tools for development. The panel encourages the academies and their stakeholders to seize these opportunities.

1. African academies of science, NASAC, African governments, donors, partner academies based outside Africa, and the global inter-academy organizations should work together by:

- ensuring that needed capacity building efforts continue
- shaping and delivering such programs within Africa to the extent possible.

2. African academies of science should strengthen and expand the capacity and capability that they have developed during this program, by developing, implementing, and sharing good practice in:

- human resource management, including training and development programs for council, members, senior executives, and staff;
- membership and election procedures;
- strategic planning, project management, and peer review;
- financial management and accounting systems;
- communications, outreach, and media relations;
- fundraising;
- risk management and accountability (including developing impact metrics);
- establishing an informal network of executive directors of African science academies to facilitate exchanges of information and best practice;
- working with government, industry, and civil society;
- encouraging informal regional leaders to become champions for regional academy development (the academies of Uganda, Nigeria, and South Africa have already emerged as regional leaders in East, West, and southern Africa, respectively).

3. NASAC should work to strengthen the institutions and activities that enable collaboration among African science academies in order to enhance the effectiveness of individual academies and empower science and science advice at the continental level. The goal should be to expand existing efforts and develop new approaches in key areas, by:

- providing assistance to African scientists seeking to launch new national academies and strengthening capacities of existing academies;
- providing clearing house services that facilitate sharing of effective academy policies, peer review, and election processes, training materials and other best practices, and information on events—including “good news” stories;
- providing distance and presence training opportunities;
- Building stronger linkages with the African Union (AU), New Partnership for Africa’s Development (NEPAD), the UN, national governments in and beyond Africa, and the global scientific community.

4. African academies of science should make every effort to broaden their financial support base to provide longer-term, more sustained financial security, by:

- developing and implementing fundraising strategies, identifying new sources of funds where appropriate;
- demonstrating to governments that core funding, without direction, supports the provision of quality scientific advice;
- designing initiatives and providing services which generate a surplus.

5. African academies of science should become more effective advocates for the contribution of science to public policy, by:

- promoting the principles and practice of evidence-based policymaking;
- delivering quality policy advice that is timely and fit-for-purpose;
- broadening both the range of policy issues covered, the mechanisms for delivering policy advice, and sharing that knowledge;
- building relationships with national and regional policymakers;
- systematically measuring the impact of policy interventions, for example, genuine policy change, anecdotal feedback, the level of support (financial or otherwise) leveraged, and/or contract activity that the academies are commissioned to undertake.

6. African academies of science should maximize the benefits which can be derived from working in partnership, by:

- exploiting their membership of regional (e.g. NASAC) and global inter-academy organizations—capitalizing on the intellectual and financial resources available to them, and contributing to their business as a further tool for capacity building;
- developing partnerships that are strategic and/or complementary, and based on shared values;
- acting as a bridge between national and regional scientific communities, policy-makers, and the wider public—for example by convening meetings/discussion fora; communicating science and its benefits, effectively and with authority; and nominating experts to sit on committees, etc., outside their own country.

7. African academies of science should be more proactive policy advocates at regional, continental, and global levels, by:

- working with each other and with other academies of science to influence policy on an international level;
- building on the Annual Meeting of African Science Academies (AMASA) developing timely policy agendas;
- building relations with their regional delegations in government, regional development communities, the AU, NEPAD, and the UN;
- engaging in global policy debates, for example, MDGs, SDGs, disaster risk reduction; contributing to their implementation, and monitoring and evaluation;
- helping to strengthen NASAC's contribution to regional policy advice.

8. African academies of science should develop and deploy best practice in increasing diversity of its membership and its core business, by

- engaging more with young African scientists and promoting opportunities for them, including involving them in academy business;
- improving diversity of ethnicity and gender at all levels within the academies, including fellowship, council, senior executive, and other staff; membership of working groups;
- tapping into the expertise and connections of the diaspora.