

# **Enhancing the Capacity of African Science Academies**

## **The Final Evaluation of ASADI**

InterAcademy Council

2015

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# InterAcademy Council

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## Foreword

In October 2013, the InterAcademy Council (IAC) was requested by the US National Academy of Sciences (USNAS) to conduct an independent, summative evaluation of the African Science Academy Development Initiative (ASADI). ASADI was a ten-year, \$20 million program undertaken by USNAS with support from the Bill & Melinda Gates Foundation. The review was intended to draw conclusions about the effectiveness of ASADI and to identify lessons that could help to guide future academy development initiatives in Africa and elsewhere.

Recognizing the importance of science academies in providing evidence-based advice and other service to their societies, the IAC Board agreed to undertake this review and appointed a Review Panel of five experts from several countries and a variety of disciplines. Professor Turner T. Isoun, Former Minister, Nigerian Federal Ministry of Science and Technology, served as chair of the panel.

From November 2013 through May 2014, the panel held two full meetings as well as numerous teleconferences. The panel also organized site visits to the academies in Nigeria, Cameroon, Uganda, Ethiopia, and South Africa that involved interviews with academy leadership, members, staff and a variety of stakeholders from government and non-governmental organizations. The panel collected a great deal of information through the site visits, interviews with ASADI staff, questionnaires, and other information provided by ASADI and by the African academies.

The document that follows is the result. First written in draft form, the final report incorporates the panel's responses to the IAC report review process during September and October 2014 that involved three expert reviewers plus a science academy president who served as review monitor. Upon the satisfactory completion of the report review process, the IAC Board approved the release of a pre-publication version of the report, which was presented at the 10<sup>th</sup> Annual Meeting of African Science Academies, held in Kampala, Uganda in November 2014. The panel makes recommendations in several significant areas. The panel urges the African academies—including those supported by ASADI as well as those that were not—to work proactively to strengthen and expand the capacity that they have developed in recent years in order to become more effective at serving their societies. The African academies (again including those supported by ASADI as well as those that were not), their governments, donors, the Network of African Science Academies (NASAC), the African Academy of Sciences (AAS), partner academies based outside of Africa, and global inter-academy organizations such as IAP—The Global Network of Science

Academies and the InterAcademy Medical Panel should also work to ensure that needed capacity-building efforts continue.

We thank all of the Review Panel members, external reviewers, and the review monitor who contributed to the successful completion of this report. Special appreciation is due to the panel chair, who devoted much time and effort to ensuring that the final product would prove valuable in the future. Financial support for this review was provided through the USNAS ASADI program, which received its funding from the Bill & Melinda Gates Foundation.

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# Report Review

This report was externally reviewed in draft form by experts chosen for their diverse perspectives and technical knowledge, in accordance with procedures approved by the IAC Board. The purpose of this independent review was to provide critical comments that would help produce a sound report that meets the IAC standards for objectivity, evidence, and responsiveness to the study charge.

The review procedure and draft manuscript remain confidential to protect the integrity of the deliberative process. Although the reviewers provided constructive comments and suggestions, they were not asked to endorse the conclusions and recommendations, nor did they see the final draft of the report before its release.

## Reviewers of the report

The IAC thanks the following individuals for their review of this report:

**Bruce ALBERTS**, Chancellor's Leadership Chair in Biochemistry and Biophysics for Science and Education, University of California, San Francisco, California, USA

**Lai-Meng LOOI**, Senior Professor of Pathology, University of Malaya; and Co-Chair, InterAcademy Medical Panel, Kuala Lumpur, Malaysia

**Cheryl DE LA REY**, Vice-Chancellor, University of Pretoria, South Africa

## Monitor of the review process

A review monitor was responsible for ascertaining that the independent examination of this report was carried out in accordance with IAC procedures and that review comments were carefully considered.

The IAC thanks the following for his participation as monitor in the review process:

**Juan ASENJO**, President, Chilean Academy of Science, Santiago, Chile

# Preface

## Platforms for Partnership

African academies of science can play a central role in providing independent, objective scientific and technological advice on policy issues of critical importance to Africa's development, targeting both their governments and other stakeholders. Generously supported by the Gates Foundation, the African Science Academy Development Initiative (ASADI) has worked to raise the profile of a select but very diverse group of African academies as strong, independent institutions, building upon the scientific merit of their members to form beacons for science and technology as a tool for development.

This review of ASADI has revealed both the strengths and the weaknesses of the program, identifying opportunities and threats for the future of science academies in Africa. It is offered as not just a "box-ticking" end of program review, but as a constructive way forward for academies in any country, highlighting what has worked well and what less well, with a view to learning from these lessons to improve future work in this area. The program has been particularly effective at building platforms for partnership and sharing good practice. One definition of capacity building that has been offered is "institutional performance improvement." The review process has provided an opportunity for the Panel to take stock of Africa's largest and most sustained program for science academy strengthening. We hope that this review will be a useful tool for academies everywhere that wish to build their institutional performance and capacity. At the same time, it helps articulate the value of academies to national, regional and continental policymakers.

Africa is not alone in facing science and technology capacity challenges. This review shows that working in partnership has benefits for all partners, and that the more deeply and widely knowledge can be shared, the greater its potential benefit. These lessons apply globally.

I would like to thank the members of the Panel and the Secretariat for their important contributions. I would also like to thank the many people who contributed throughout the review, including the staff at the US National Academies who have worked on ASADI, the members and staff of the ASADI-supported academies, and the many stakeholders whom the Panel interviewed in the course of conducting the review; they are listed in the Data Catalogue that forms Appendix C. They have all helped to bring clarity to what capacity building means and what it might look like in the future, not just in Africa, but in developed and developing countries everywhere.

Turner T. ISOUN  
ASADI Review Panel Chair



## 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.

# 1

## Methodology of the Review

The review described in this report was a mandatory part of the African Science Academy Development Initiative (ASADI) process, which called for both a midterm and a final review. It is intended to measure the extent to which the original objectives of ASADI had been met; to examine ASADI's further impact on academy organization, activity, and effectiveness; to describe the lessons learned during the ASADI process; and to "capture relevant insights regarding the methods employed by the ASADI program, sustainability, and future initiatives to maintain and expand built capacity" (see the complete statement of task in Appendix G). In the course of performing this last aspect of the task, the panel developed conclusions and recommendations about future capacity-building of African science academies. The contract to carry out this review was awarded to the InterAcademy Council (IAC).

The midterm review was carried out by EnCompass LLC and OtherWISE: Research and Evaluation in August 2009, and completed in March 2010. It is an extensive and valuable document. But this final report is a free-standing review of ASADI and can be read without a prior reading of the midterm review.

The final review that is the subject of this report was carried out by a panel organized by IAC. The panel was chaired by Professor Turner T. Isoun, formerly federal minister of science and technology of Nigeria, and was supported by a small secretariat. The review was carried out between October 2013 and November 2014.

### EVIDENCE GATHERING

The panel used a range of techniques to assess the effects of ASADI, and to inform its views on the next steps for the academies themselves and for the systems of which they form part.

Of these, perhaps the most informative was a series of site visits to the ASADI intensive-partner academies—the Cameroon Academy of Sciences (CAS), Ethiopian Academy of Sciences (EAS), Nigerian Academy of Science (NAS), Academy of Science of South Africa (ASSAf) and the Uganda National Academy of Sciences (UNAS). These took place between March and May 2014.

Each visit involved at least one panel and one secretariat member in structured discussions with academy staff at all levels, especially those who had been involved in ASADI-led training, and with academy members and leaders. In addition, interviews were held with a wide range of individuals in government, higher education, and other stakeholder organizations that had interacted with the academies. The host academies identified the stakeholders that were interviewed during the site visits. The panel identified additional experts that were interviewed by panel members and staff during the site visits, or by telephone or Skype. The panel is grateful for the generous amounts of time made available for these interviews, often by busy people with significant responsibilities. Their willingness to participate is itself testimony to the importance of ASADI. They spoke to the panel on a confidential basis and are not quoted directly in this report except by specific consent. A total of 102 individuals were interviewed during the site visits—57 were academy stakeholders (leadership, members, and staff) and 45 were external stakeholders (from government, nongovernmental organizations, academia, and industry). Apart

from the site visits, an additional eight experts were interviewed by panel members and staff, mostly by telephone or Skype.

Two members of the ASADI review team, Panel Chair Isoun and Study Coordinator Dorothy Ngila, provided continuity by attending all of these visits, which were crucial to the review's understanding of the issues facing the very diverse group of ASADI partner academies.

A second major input to the review was a pair of questionnaires completed by the academies. One focused on the key experiences of the academies during ASADI. The other was designed to help the panel evaluate how well the ASADI program objectives had been met. They examined issues such as the academy's role in its own national science system, the changes in its standing resulting from ASADI, its role in supporting other national academies, and continuing challenges which might be addressed in coming years.

The third standardized input for the review was a grid-style document termed the Evolution Table. Each academy prepared this table itself. It was used to capture changes in the academy's status in every field from its legal standing to its policy influence, its internal and external communications, and its organizational and financial capacity, with particular reference to ASADI's contribution to its recent development. These make up Appendix I of this report.

The U.S. National Academy of Sciences (USNAS) ASADI program board and staff also provided extensive input to the review. The chair and director of ASADI spent several hours with the panel at its January 2014 meeting in London, and other ASADI staff members joined the discussion by videoconference. Questionnaires were completed by ASADI staff members, including the director and the country directors that worked closely with CAS, EAS, NAS, ASSAf, and UNAS. The former country director that worked with ASSAf was also interviewed. The ASADI staff also held teleconferences with panel members and staff prior to site visits. This allowed the panel to examine the level of agreement and disagreement between ASADI participants in Washington and Africa on the reality of the ASADI experience. A comparative analysis of the answers was conducted as part of the data analysis described below.

USNAS also provided an extensive amount of written material concerning ASADI. As the catalogue of inputs to this review (Appendix C) makes clear, the ASADI project has been richly documented. As well as material generated specifically for the review, the panel was able to consult the original project material submitted by the USNAS to the Bill & Melinda Gates Foundation; ASADI's own annual reports; the midterm review; a lengthy list of publications from each of the academies, and copies of many of these publications, including material with both a policy and a scholarly orientation; a range of policy, organizational, and financial documentation about each academy; interviews with the USNAS ASADI team members and written contributions from them; and a wealth of ASADI training documentation, itself a key output of the project. The catalogue of academy publications comprises Appendix D.

The Council for Scientific and Industrial Research (CSIR) was commissioned to carry out the data analysis component of this evaluation. The data analysis used qualitative and quantitative methods to:

1. Collate, synthesize, and summarize annual reports and other documents that provide information on the ASADI project with the aim of identifying key themes emerging from the reports;
2. Summarize financial statements and information over the grant period;
3. Produce a summary of the outputs by academies in the form of workshops, conferences, and publications;

4. Catalogue all the information received so far for the evaluation; and
5. Identify data gaps in the documents analyzed.

At a Washington summit meeting in August 2014, ASADI participants were asked to carry out an informal SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the ASADI experience. An edited summary of their responses comprises Appendix H, and provides further evidence to support the findings of the Review Panel.

In addition, material was collected on ways in which the academies collaborate with each other and with other academies, for example via AMASA, the Annual Meeting of African Science Academies.

The majority of the evidence available to this review concerned the five primary ASADI partner academies, also referred to as the “intensive partners.” This report does not deal in detail with the smaller-scale ASADI activities in Ghana, Kenya, and Senegal, known as the ASADI secondary partners, nor with ASADI’s involvement with the African Academy of Sciences.

The volume of material made it obvious to the panel that a further analysis phase would assist the writing of this report. This phase of the project involved commissioning experts from South Africa’s CSIR to synthesize and summarize the documents and outputs, identifying specified themes and summarizing ASADI’s financial statements.

The next stage of information-gathering was a round of telephone and Skype interviews, intended to fill gaps in the panel’s knowledge or to reach people whom it had proved impossible to meet in person. Finally, there was a later round of questionnaires which the academies completed on specific topics of interest such as the use of forums to develop policy advice.

## **STRUCTURE AND DEVELOPMENT OF THE REPORT**

The overall direction and structure of this report were the subject of two panel meetings, the first hosted by the Royal Society of London in January 2014, and the second by ASSAf in Pretoria in May 2014. Following the second panel meeting, a draft report was prepared, which was then finalized by the panel through a series of conference calls and other exchanges. The panel’s draft was then reviewed by external experts according to IAC’s standard procedures.

It is notable that when asked in the questionnaires about their progress under ASADI, the academies were more modest about their achievements than were external observers such as government. This modesty was one principal difficulty for the review process itself.

Another complicating factor is that even without ASADI, these academies would not have stood still during the 10-year period under review. So it would be wrong to attribute all positive change in the academies to ASADI. They would have changed of their own accord, and via the support which many of them received from academies in the developed world and their governments.

It is important to stress that this report is a review of ASADI. It is not a review of African science academies, or of any other organization or network. And it is certainly not a review, assessment, or appraisal of any individual.

## **VALUE OF THE REVIEW EFFORT**

The IAC ASADI review was a considerable undertaking, appropriate to an exercise of the cost, scope, and duration of ASADI itself. It involved a wide range of information-gathering from

many individuals and organizations with direct or indirect connections to ASADI and the academies it supported. The panel believes that this level of review adds value beyond confirming that ASADI met its nominal objectives, by highlighting a broader range of ASADI outcomes and providing a focus on the future development of African science academies.

## Review of ASADI's Formal Objectives

Many of the world's nations have a national academy of science, with over 100 learned academies belonging to the IAP—the Global Network of Science Academies. Some have more than one, for example with specialisms such as engineering, medicine, or the social and human sciences as well as the natural sciences. Their missions have changed over time, adding an advisory role to their traditional honorific one. They are typically involved in a range of activities that include representing science to government and the public, providing scientific and science policy advice to government, scholarly publishing and meetings, and representing the nation's scientific community on the world stage. Their credibility is based on the quality of their work, and on the status of their members, who are drawn from the nation's leading scientists on the basis of merit.

The African Science Academy Development Initiative (ASADI) was set up in the belief that African societies and citizens stand to gain from a strengthened network of science academies. Funded by the Bill & Melinda Gates Foundation and undertaken by the U.S. National Academy of Sciences (USNAS), it devoted US \$20 million to supporting academies in eight countries of sub-Saharan Africa between 2004 and 2015. The funding was made available to individual academies, not for overarching activities and organizations.

ASADI also had lesser resources from beyond the Gates Foundation, including charitable funders, the private sector, the World Bank, and the World Health Organization. This money was used to support training, meetings, publications, and other activities.

Because of the Gates Foundation's interest in health issues, many ASADI activities were oriented towards health. However, ASADI's principal mission was capacity-building, and the capacity that it created has allowed the academies to improve their performance in all fields of science.

### ENVISAGING ASADI

The origins of ASADI lie in suggestions made by individuals in the United States and Africa to the Gates Foundation about the health and development benefits that could flow from better science advice in African nations. African academies had tended to be honorific bodies rather than being active in science policy activities, including science for policy, policy for science, and the public understanding of science. When the ASADI program started, there were less than 12 science academies in Africa—there are now 19 that are members of the Network of African Science Academies (NASAC).

The task that ASADI took on turned out to be long-term in nature, and involved an unusually long 10-year remit. The hope was expressed to the Review Panel that its success might lead to further such capacity-building investment, both long-term and for individual focused projects.

Part of the reason for ASADI's long timescale is that as well as building capacity in the academies, it is necessary for governments to be capable of receiving informed advice on

complex scientific issues. The ASADI primary partner academies have made great strides in ensuring that they are heard and respected by their governments.

A summary of the amounts spent, the spending profile over time, and the amounts awarded to the various recipients comprises Appendix B, while Appendix F is a timeline of ASADI activity. However, it is worth noting that ASADI's resources were deliberately not spent equally in each of the partner countries. Nigeria, South Africa, and Uganda were chosen as initial "intensive partners," while later decisions led to substantial spending in Cameroon and Ethiopia. Far smaller sums were committed to activities in Ghana, Kenya, and Senegal and by the African Academy of Sciences. This report concentrates on the five primary ASADI partners.

## THE FORMAL OBJECTIVES

ASADI had a general mission to increase the capacity of African science academies and raise their national and international standing, with special reference to their ability to deliver valuable policy thinking to governments.

The scale of this task can be seen from the first column of the review's Evolution Tables (Appendix I). It shows that the academies supported by ASADI were in tangible need of development at the start of the process. They lacked essentials such as staff, office space, and basic equipment. They were poorly structured in terms of the workloads and roles of council members and staff. Their existing staffs were undertrained and could not meet their potential. And while the academies' links to government were usually functional at a low level, they had too few contacts with the private sector and nongovernmental organizations (NGOs). Some lacked legal status in their own country, and all were short of money.

ASADI's broad ambition was encapsulated in seven specific objectives. They 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.

Our analysis shows that these targets were met and exceeded.

For the first objective, partnership development with the ASADI academies, the ASADI team spent substantial time in face-to-face and electronic communication with members and executives of the African academies throughout the 10 years of ASADI activity. There were also

annual networking and joint working conferences to build communication between African academies and between these academies and the rest of the world, including the major AMASA event, and a wealth of informal contacts. The training delivered by ASADI and described in the next section inherently required contact and dialogue at an operational level and was a key ASADI success.

For the second objective, training approximately 30 academy staff, both staff and council members took advantage of training at the USNAS, in-house at their own academies, by Skype or teleconference, and at learning collaboratives during AMASA meetings. Over 70 people including 40 academy staff members received training by these means. These staff members have in turn trained an additional 18 staff within their own academies, and 46 in other academies. In total, over 100 people have benefited from ASADI training. So this target was met, and massively exceeded. Feedback from the USNAS and the ASADI academies suggested that this secretariat-strengthening activity was the most successful part of ASADI.

The third objective involved academies in developing machinery for evidence-based policy. Their success in doing this is attested by the wealth of policy advice and documents mentioned under objective four below. The academies used a variety of means to expand their policy advisory capacity. These ranged from running meetings on specific issues to setting up standing and advisory committees and other permanent fora.

The workshop program began with a session on microbial threats to food safety, held in Washington, DC, in 2006 and intended to allow African participants access to U.S. expertise and resources. Since then, over 20 workshops have been held with ASADI support, drawing in national, African, and world experts. The subject matter has been wide-ranging and includes malaria, HIV and AIDS, blood safety, agriculture and nutrition, mother and child nutrition, laboratory management, biosafety and biosecurity, mental health and neurological care, fundraising, and media relations.

For objective four, the completion of 18 policy advisory activities, 29 study reports were identified as being supported by ASADI. They are itemized in the data catalogue in Appendix C. This total exceeds the target by over 50 percent. Most of these reports are concerned with health or with related themes such as nutrition. The academies produced over 100 reports, training documents, meetings proceedings, and other publications during the ASADI period.

Objective five is concerned with enhancing physical and human infrastructure. Each of the five academies reports a material improvement in its facilities as a result of ASADI. For example, Uganda National Academy of Sciences (UNAS) has turned from an organization with a solitary computer to having eight computers, plus other equipment, in an office on a major university campus. The Nigerian Academy of Science (NAS) has been able to add reliable power supplies, a proper online presence, and meeting space, and plans a new building. Likewise the Ethiopian Academy of Sciences (EAS) and the Academy of Science of South Africa (ASSAf) now occupy larger and better-equipped office space and have their own online presence, run by in-house personnel or under contract with external experts.

The aim of enhancing human infrastructure overlaps with objective two above. In South Africa, staff numbers at ASSAf have grown from five at the start of ASADI to 35 now, with more formal personnel, retention, and training systems in place. In Uganda, staff numbers have grown

from one to nine. This growth has involved the adoption of more formal systems such as staff retreats and a staff manual. Structures and systems have also expanded in the other three main partner academies. In Cameroon, involvement in ASADI led to the post of Program Officer being developed to allow new activities to be carried forward.

As with the whole of this review, it would be wrong to imagine that these academies would have remained unaltered during the period in question in the absence of ASADI. But it is probable that its presence was a major contributor to their development.

Objective six concerns the use of annual workshops and meetings to strengthen African academies in their ability to work together. The ASADI annual conference, later renamed AMASA, has been important in building cooperation between academies on key issues, and therefore in meeting this objective, and allowed the ASADI board and team to get and offer feedback on the program. Held annually from 2005 in Nairobi, Yaoundé, Dakar, London, Accra, Somerset West (South Africa), Kampala, Lagos and Addis Ababa, the AMASA events have attracted participants from across Africa and beyond, and from academies not involved in ASADI. Themes have included issues connected with health, such as newborn and child health, and topics such as water supply, energy and climate change, which affect a wide range of issues around health and sustainability.

Objective seven, the review of the ASADI process, began with the publication of the mid-term report, and is completed by this document.

To summarize, ASADI met and exceeded its formal objectives in terms of African/U.S. academy partnership activity; the training of academy staff; the development of policy advisory machinery in health and sustainable development; the completion of policy advisory reports; the upgrading of human and material academy capacity; the development of African science academy cooperation; and in the evaluation of its activities. However, success in the formal objectives of ASADI is only the start of the story, which will be developed in the next three chapters.

## **SCIENCE AND TECHNOLOGY LANDSCAPES AND SITE VISIT SUMMARIES FOR THE ASADI INTENSIVE PARTNERS**

### **Cameroon**

Cameroon is located in West Central Africa and is divided into 10 administrative regions. Executive power is exercised by the president, and the nation has a population of 23 million. Cameroon is a member of the Economic Community of Central African States (ECCAS) and the Central African Customs and Economic Union (UDEAC). Cameroon belongs to the Commonwealth as well as francophone regional formations.

Cameroon is considered Central Africa's strongest nation in scientific research. There are eight state universities and approximately 32 private and mission universities and polytechnics. Science and technology are managed through the Ministry of Scientific Research and Innovation (MINRESI). The Ministry of Higher Education (MINESUP), four research institutes (the Institute of Agricultural Research and Development, the Mining and Geological Research Institute, the Institute for Medical Research and Medicinal Plants Studies, and the National Institute for

Mapping) the Radio Protection Agency (ANRP), the Local Materials Promotion Authority (MIPROMALO) and the National Education Center (CNE) conduct research and promote innovation.

Cameroon has one science academy, the Cameroon Academy of Sciences (CAS). CAS was established in 1990 and has a vision to be the prime mover of science and technology, making scientific knowledge available to decision and policymakers with a view to influencing investment priorities in science and technology, and promoting the use of science and innovation in the economic, social, and cultural development of Cameroon. As of 2014, CAS had 88 members who are elected by merit, and divided into colleges of biological sciences (39), mathematical and physical sciences (25) and social sciences (22), plus one honorary fellow.

For the ASADI review, a site visit was conducted on 10-11 March 2014, in Yaounde, Cameroon. Interviews were conducted with academy members, the executive committee, management, and staff of CAS, and stakeholders representing government, research institutes, and charitable organizations. Altogether, the ASADI team interviewed 21 stakeholders in Cameroon. The overall impressions from the site visit were that CAS members are highly invested in its operations driving policy advisory activities. As a result, CAS is able to produce many reports with very little staff support.

CAS provides policy advice, primarily in the areas of health, climate change, and food security and agriculture. Its advice is produced by working groups that are managed by members. At the time of the site visit, MINRESI had not yet commissioned work from CAS. However, shortly after the site visit, CAS was asked to coordinate a national conference on biotechnology following the Declaration of the 9<sup>th</sup> Annual Meeting of African Science Academies (AMASA 9) issued in November 2013, which dealt with biotechnology.<sup>8</sup> Looking into the future, and on the basis of the site visit, the main challenges faced by CAS are financial and staff sustainability, and its lack of an establishing Executive Act or Parliamentary Act.

## Ethiopia

Ethiopia is located in the Horn of Africa and has a population of 98 million. The prime minister is the head of government and exercises executive power. Ethiopia has nine semi-autonomous administrative regions that have the power to raise and spend their own revenues.

There are over 30 public universities in Ethiopia. In addition, there are a number of key research institutes, which are affiliated with line ministries, such as the Ethiopian Institute of Agricultural Research (EIAR) and the Institute of Biodiversity Conservation (IBC). Science and technology are managed through the Ministry of Science and Technology, established in 2008 and headed by a minister using the framework spelled out in the Science, Technology, and Innovation Policy of 2011.

Ethiopia has a single science academy, EAS. The establishment of EAS by an Act of Parliament in March 2013 was preceded by a series of activities undertaken by a group of prominent scholars from 2007 onwards. The vision of the EAS is to realize the development of scientific culture and scholarship in Ethiopia, and the improvement of the quality of life of its people. In 2014, the membership of the academy, elected by merit, comprises 77 fellows, two associate fellows and one honorary fellow. The membership is divided into disciplines, which

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<sup>8</sup> Available at [www.eas-et.org/AMASA9\\_Doc/English%20Declaration.pdf](http://www.eas-et.org/AMASA9_Doc/English%20Declaration.pdf).

form working groups that conduct studies. The areas covered are health, agriculture, engineering and technology, social sciences, and natural sciences.

The ASADI review site visit was conducted from 31 March-1 April 2014 in Addis Ababa, Ethiopia. Interviews were conducted with academy members, the executive committee, chairs of EAS working groups, management and staff of EAS, and stakeholders representing government, research institutes, the Addis Ababa University, and the private sector. The ASADI team interviewed a total of 22 stakeholders in Ethiopia. The overall impressions from the site visit were that although EAS is the youngest ASADI-supported academy, it has made great strides in terms of securing physical infrastructure and an endowment, building strategic partnerships, and gaining official status through an Act of Parliament. EAS is an all-encompassing academy that recognizes excellence in all scientific disciplines including the social sciences, the arts, the humanities, and engineering. EAS has secured budgetary support from the government, and is the only nongovernmental body represented on the country's science, technology and innovation council, where 14 cabinet members serve. Key challenges faced by EAS, on the basis of site visit impressions, are financial sustainability, support by professional staff for EAS working groups, and meeting the high expectations of stakeholders.

## **Nigeria**

Nigeria is a federal constitutional republic located in West Africa and comprising 36 states, one federal territory and 774 local governments. Executive power is exercised by the president. The country has a population of 179 million, making it Africa's most populous nation.

Nigeria has more scientists than any other nation in Africa. Research is conducted mainly by federal industrial research institutes, state research institutes, polytechnics, and its 48 universities. Research and innovation are funded by the government, and the small and medium enterprise (SME) sector plays a key role in science and technology development in the country. Science and technology are managed through the Federal Ministry of Science and Technology.

There are five academies in Nigeria which focus on, respectively, science, engineering, social sciences, arts and letters, and education. The NAS represents the science disciplines. It was established in 1977 and its vision is an improved quality of life for Nigerian society through the promotion and application of science and technology. In 2014, the fellowship of NAS comprises 42 foundation fellows among a total fellowship of 159 fellows and three foreign fellows covering all fields of science including engineering and medicine.

The ASADI review Nigeria country visit was conducted from 4-6 March 2014 in Lagos and Abuja. Interviews were conducted with NAS members, the council, management and staff, and stakeholders representing federal and state governments, the University of Lagos, and nongovernmental organizations (NGOs). Altogether, the ASADI team interviewed 22 stakeholders in Nigeria.

The overall impressions from the site visit were that NAS has undertaken a significant amount of impactful policy advisory work in the area of health; the NAS membership is an asset that can be used to forge linkages; and NAS is seen by many stakeholders as having an important voice and the capacity to capitalize on its stature to leverage funding and partnerships. For example, NAS leadership participated in a 2014 Presidential National Conference where the federal president discussed the country's strategic planning. It was clear that NAS has cultivated strong working relationships with key NGOs in the health sector, as evidenced by the number of NGO representatives the committee met in both Lagos and Abuja, and that it has benefitted from

visionary and strategic leadership. Future challenges faced by NAS, based on the site visit impressions, are staff and financial sustainability, the lack of an Act of Parliament, and building its brand at the federal government level.

## **South Africa**

South Africa is located in the southern tip of Africa and has a population of 52 million people. It is headed by a president who exercises executive power. It has 23 public universities and one private university. The White Paper on Science and Technology governs South Africa's science, technology, and innovation. The Department of Science and Technology (DST) is the custodian of the national system of innovation. Research and innovation are conducted through sector-specific, department-based research institutes (DBRIs), such as marine and coastal management in the Department of Agriculture, Forestry, and Fisheries, and through science councils spanning sectors such as health and agriculture. These include organizations such as CSIR, the Medical Research Council, and the Agriculture Research Council.

ASSAf is the official national academy of science representing South Africa internationally. There are three other academies in the country: the Royal Society of South Africa, the South African Academy of Engineering, and the Akademie vir Wetenskap en Kuns. ASSAf was inaugurated in 1996 in response to the need for an academy consistent with South Africa's new democratic government. It is intended to be activist in its mission of using science for the benefit of society, with a mandate encompassing all fields of scientific inquiry in a seamless way, and including in its ranks the full diversity of South Africa's distinguished scientists. In 2014, ASSAf had 426 members representing all scientific disciplines and including the humanities, social sciences, and engineering.

The ASADI review site visit was conducted on 19, 20 and 23 May 2014 in Pretoria and Cape Town. Interviews were conducted with ASSAf members, the council, chairs of standing committees and study panels, ASSAf management and staff, and stakeholders representing government, the media, foreign missions, and the private sector. The ASADI team interviewed 22 stakeholders in South Africa.

ASSAf has organized its policy advisory activities into the following areas: health, environment and energy, biosafety and biosecurity, the humanities, and science education. The overall impressions from the site visit were that having a professional secretariat is critical for the functioning of the academy; having a visionary, insightful, and energetic leadership has shaped the trajectory of the academy; and that the academy was seen by many stakeholders as a neutral partner that provides independent and objective advice to the nation. ASSAf has a strong relationship with the Ministry of Science and Technology. Looking into the future, and on the basis of the impressions gained during the site visit, the challenges faced by ASSAf include meeting the expectation of stakeholders as the demand for advice increases—especially from government, diversifying its membership base, sustaining the volunteer service of its membership to ASSAf activities, and maintaining a professional staffing base to meet the increasing demands for academy advice.

## Uganda

Uganda is a landlocked country in East Africa with a population of 39 million, and whose executive power is exercised by the president. Uganda is divided into districts spread across four administrative regions, and further subdivided into counties.

The country has seven public and 30 private universities. Science and technology are managed by the Ministry of Finance, Planning, and Economic Development, which has created the Uganda National Council for Science and Technology (UNCST). The Science, Technology, and Innovation Policy for Uganda and the UNCST Strategic Plan for 2009-2014, provide the broad framework for science and technology. Institutes that conduct research in the country include the Uganda Industrial Research Institute, the Uganda National Health Research Organisation, the Uganda Virus Research Institute and the National Agricultural Research Organisation.

UNAS is the only academy of science in Uganda. It was established in 2000 as a non-profit organization functioning as an honorific membership organization. Its vision is to be regarded as an eminent body of scientists offering independent, merit-based advice to the government and the public for the prosperity of Uganda. In 2014, UNAS membership totalled 200, of whom 57 are fellows. Members represent all scientific disciplines, including the social and behavioral sciences, as well as engineering.

The ASADI review site visit was conducted 27-28 March 2014 in Kampala. Interviews were conducted with UNAS members, the council, and management and staff as well as stakeholders representing government, non-profit organizations and the Parliament of the Republic of Uganda. Altogether the ASADI team interviewed 15 stakeholders in Uganda. UNAS has organized its policy advisory activities to include health, science education, agriculture, and biosafety and biosecurity.

The overall impressions from the site visit were that UNAS has been undertaking studies of relevance to the Ugandan system, as reported by the key stakeholders interviewed; that stakeholders who had been recipients of UNAS policy advice were using the recommendations to amend and enact policies for the country; that UNAS has been instrumental in identifying key policy issues in the country especially in the health sector, an area where there were existing knowledge gaps; and that its structure and model of operations, as well as the competence of its staff, ensured the smooth running of convening activities. Notably, 100 percent of the fellows pay their membership dues (\$40 per year). The role of UNAS in supporting the work of the Parliamentary Committee on Science and Technology, through providing it with critical information before bills are passed, was especially praised. Looking to the future, the site visit suggested that the key challenges faced by UNAS are staff and financial sustainability, the lack of a supporting Act of Parliament, and the need to find a permanent home.

## 3

### ASADI's Wider Impact

As discussed in chapter 2, the African Science Academy Development Initiative (ASADI) met and exceeded the stated aims for success set out in its formal objectives. In this chapter the wider effects are examined.

ASADI was principally intended to enhance the capacity of African science academies as trusted advisers to government, and, as part of this process, to increase government and societal awareness of academies as worthwhile sources of judgement and evidence. Other aspects of the work commonly undertaken by academies, such as public outreach, were regarded as important, but as less of a priority.

The original motivations for ASADI included the recognition that science academies have a “unique comparative advantage” of objectivity and expertise, including access to global as well as national experts. They can tackle issues of risk and uncertainty in an objective way and can be open and transparent about their actions. The panel was also sensitive to the fact that these academies each operate in a unique national political setting, and that independent advice to government may not be a well-established concept in all of them.

The chair of the review panel, Turner T. Isoun, has argued that many aspects of the western approach to science and technology development do not translate directly to the African context. An example is the assumption, often regarded as obvious in the North, that the private sector is the most appropriate home for high-technology innovation. In the same way, it is not clear that the western academy model is ripe for translation to Africa in every detail.

As one U.S. expert put it to the panel: “There are many ingredients to a successful, sustainable, service-oriented academy. Some were in ASADI’s control and some not so much. Money and training can't make up for weak leadership. Dealing with these leadership challenges required cultural sensitivity, diplomacy, patience, and firmness. My hope is that ASADI will be viewed as catalytic, but in the end the African academies control their own destinies.”

#### CRITERIA FOR EVALUATING WIDER IMPACTS

The panel decided to examine ASADI’s wider impact in terms of seven criteria, thinking in each case about whether ASADI had caused an increase in the capacity of the five primary academies. This capacity enhancement was especially apparent in the South African and Nigerian academies, which were “graduated” from ASADI and are now regarded as self-standing, capable organizations. However, big changes were noted in all five of the primary partner academies.

The seven criteria were:

- Organizational stability and effectiveness
- Financial sustainability
- Strategy development
- Engagement with government and other stakeholders
- Productivity in terms of activities and outputs
- The activity level of academy members, including council members

- Regional and international engagement

### **Organizational Stability and Effectiveness**

The training of academy staff was a principal ASADI activity, carried out in Africa and in Washington, DC. In addition, substantial ASADI resources were devoted to building up the secretariat strength of all five academies, and to expanding the academies' ability to use their staff effectively. This has involved training to enhance the skills and abilities of staff members in addition to increasing the number of academy employees.

The Ethiopian Academy of Sciences (EAS), a new and fast-developing organization, reports that before ASADI, it had a very small secretariat with no defined policies, structures, and procedures. It now has all of these. In addition, ASADI support for the EAS has been used for extensive staff training. The academy reports that the need for such expansion had been apparent for some time, but the academy did not have the resources to sustain it.

The most striking example is that of the Academy of Science of South Africa (ASSAf), whose staff grew in numbers from five to 35 (including part-time staff and interns) during ASADI. This expansion has been backed up by enhanced training and a more formal human resources system. As a result of these improved processes, staff turnover is much reduced, although personnel retention remains a problem area.

A similar story is apparent in the growth of the Ugandan National Academy of Sciences (UNAS) from one staff member to nine, and in the rapid expansion of the Nigerian Academy of Science (NAS). UNAS's situation is described in more detail in box 3-1. The exception is in Cameroon, which has only one member of staff and whose council and other members play vital roles in its day-to-day operations. Academy members rather than staff carry out most of the organization's activity.

However, it is worth remembering that even a body with perhaps 30 staff is only a medium-sized employer at best. ASSAf, the biggest of the academies, has 35 staff but has only recently hired a professional human resources manager, who has taken on duties previously shared among top management. UNAS reports that it still has difficulties in paying adequate salaries to the professional people it needs.

It is also notable that when asked about their "internal communications" work, the academies mainly mention activities for members and the wider stakeholding public. However, the team's site visits exposed a number of examples of good internal communications. As they grow in numbers, it may be valuable to develop further activities intended to keep staff informed and motivated, in part to help with staff retention.

While individuals have every right to career mobility, high levels of staff turnover among staff trained by ASADI may limit the permanent effect of ASADI's capacity-building work. Some of the academy secretariats supported by ASADI remain fragile in numbers and vulnerable to the loss of key people such as finance experts. This points to the need for continuing targeted support for institutional capacity-building, for example the construction of staff manuals that set out organizational policies and encapsulate individual academies' values and culture.

### **Financial Stability**

One way in which ASADI enhanced the financial stability of the five academies was by training for their finance officers. This training, some delivered in Washington, DC, by the U.S.

National Academy of Sciences (USNAS), was generally praised by those who had received it. ASADI also provided partner academies with backup financial management for their grants as needed.

**BOX 3-1 Uganda: Organizational Stability and Effectiveness**

UNAS says that “capacity of the office and staff” has been transformed by ASADI. Its support has been used to develop staff skills, and to equip them to work effectively. Although other donors and partners, such as the Wellcome Trust and the Royal Society, were important to this step change in UNAS’s abilities, ASADI was the key player in a process that led to staff numbers growing from one at the start of ASADI to nine in 2014. They are supported by better training, a formal personnel manual, and annual staff development retreats. Resources of computers and other equipment have grown in line with staff numbers.

An example is the ASADI training for the academy’s financial officer. UNAS now has excellent financial controls and, perhaps uniquely, its fellows all pay their annual dues on time. This success has led to UNAS helping ASADI to provide finance training for the Nigerian academy.

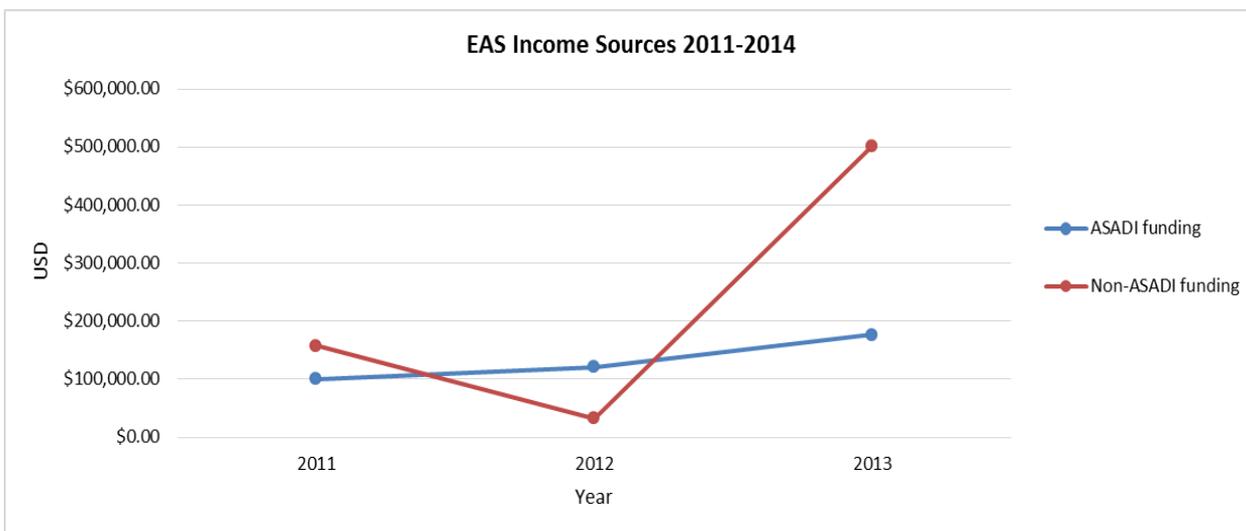
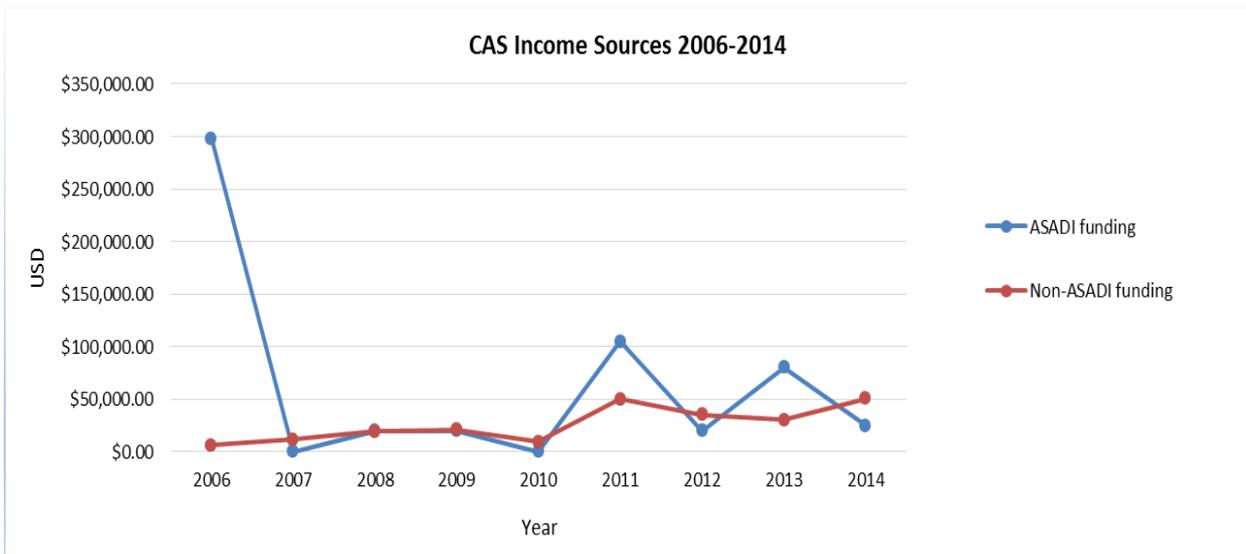
UNAS was founded only in 2000 and is not yet backed by an Act of Parliament, so it is important for it to demonstrate its value. ASADI’s backing allowed it to acquire a better headquarters (on the campus of Makerere University) and led to staff being trained in the production of consensus studies and other policy documents. A 2013 document on malaria reduction has been particularly influential, since malaria is Uganda’s leading cause of morbidity and death. Expansion has also allowed UNAS to host the scientific and professional activities of the Uganda AIDS Commission, a key national body. And although much of its work is connected to health, UNAS has been able to diversify into areas such as agriculture and science education. It now “has the ear of the prime minister” and other key figures in Ugandan policy circles, and its work on biosecurity and biosafety was a key input to national legislation. The panel was told by a Ugandan parliamentarian that UNAS has expanded parliament’s capacity to use scientific evidence and advice in its deliberations. This increase in UNAS’s scope has allowed it to become more effective as a leader and partner for other academies, including those of Ethiopia and Mauritius.

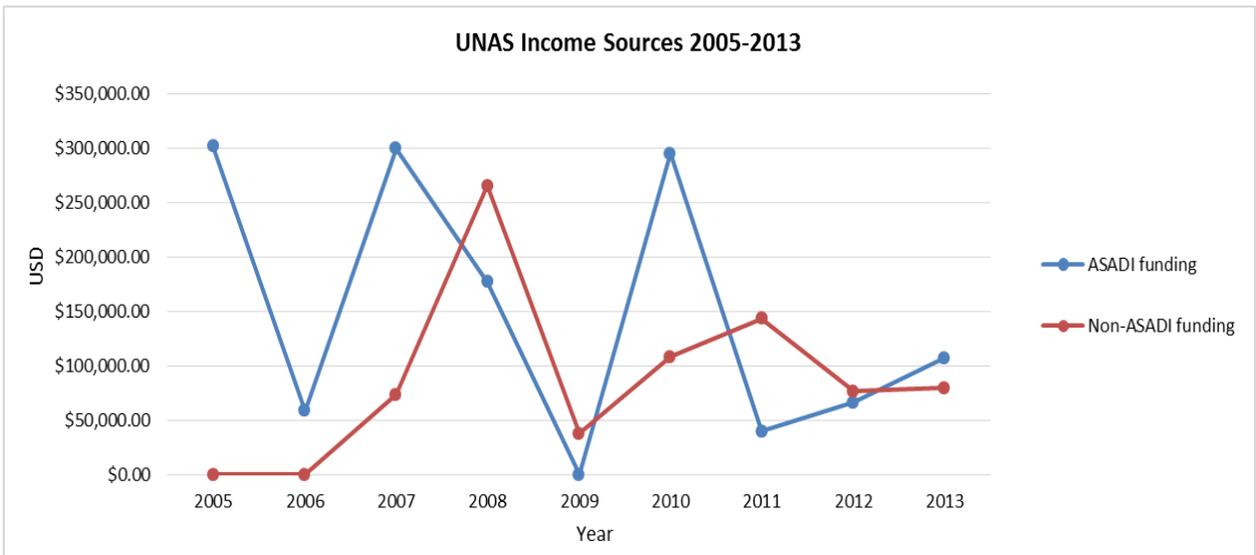
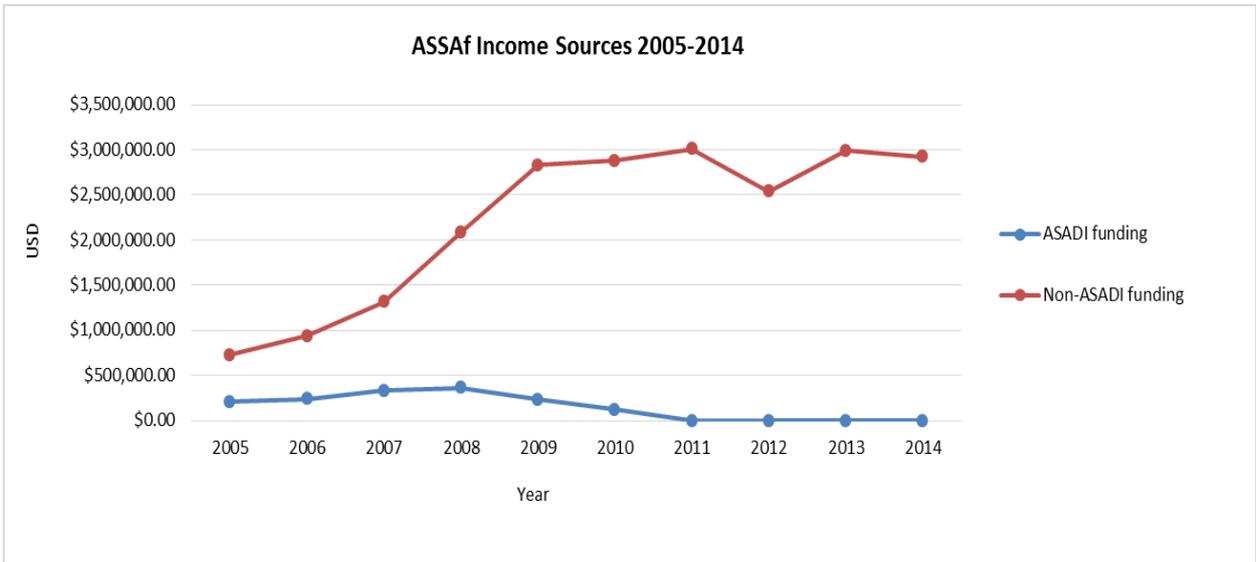
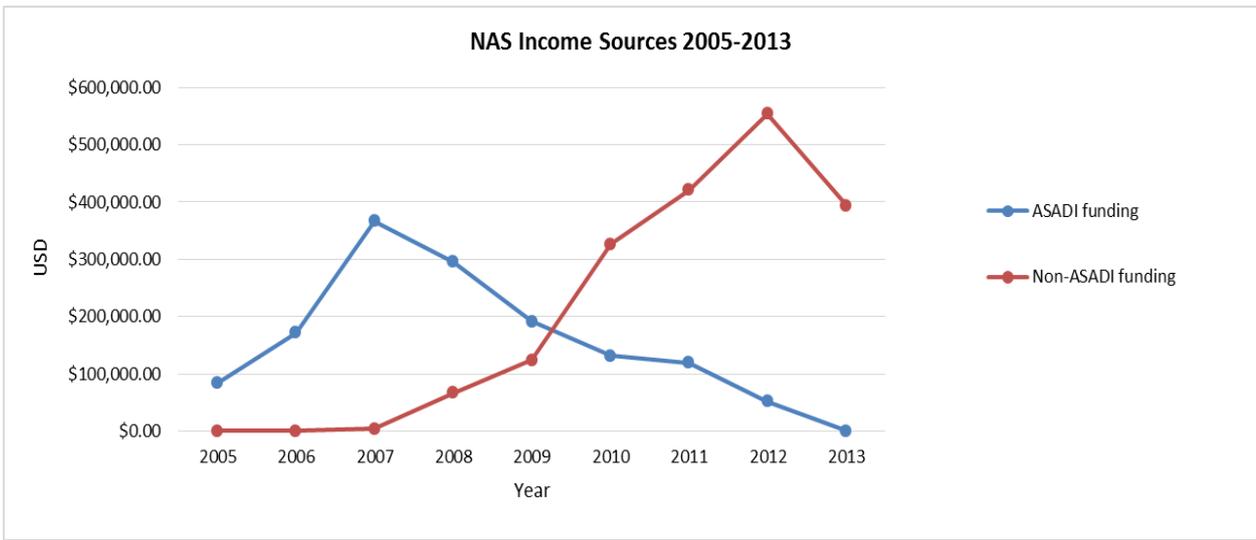
ASADI was also intended to develop the academies’ abilities to draw financial support from new sources once the initiative itself ended. Here there are signs of success, as figure 3-1 demonstrates. Figure 3-1 shows the ASADI and non-ASADI income at a broad level. Some of the apparent volatility results from transfers to academies during the years that they hosted AMASA meetings and other factors that influenced the timing of payments. The most striking case (see box 3-2) is EAS, which has used ASADI support to establish itself as a formally-structured organization with government financial support, official legal standing, and an important and recognized national role.

The Cameroon Academy of Sciences (CAS) now receives support from the Cameroon science ministry, MINRESI, the German National Academy of Sciences, Leopoldina, and by

foundations such as Helen Keller International. The Nigerian Academy of Sciences (NAS) has an even broader range of support, from actors such as federal and state governments, international agencies, and nongovernmental organizations (NGOs), as well as income derived from an endowment.

**FIGURE 3-1:** Income Sources of ASADI-Supported Academies (data provided by CAS, EAS, NAS, ASSAf and UNAS)





### **BOX 3-2 Ethiopia: Financial Sustainability**

EAS is a new organization, established in 2010 and enshrined in legislation as an independent organization in 2013. It has 77 fellows and other members and covers all disciplines, including the natural sciences, mathematics, the health sciences, agricultural sciences, engineering, social sciences and humanities, fine arts, and letters.

It has used ASADI's resources to establish itself as a significant force in Ethiopian public life, and recognizes that ASADI has allowed it to enhance its capacity and influence at a key point in its history. It is the only nongovernment body with a seat on Ethiopia's cabinet-level Science and Technology Commission.

EAS was founded five years after ASADI began and was not an ASADI intensive partner from the beginning. It received only \$305,000 from the program. However, this money was of vital importance to a new organization that had to prove its value. Its president has said that "because of ASADI, people had evidence that the young academy could perform. ASADI was the nucleus for the development of the academy."

EAS reports that ASADI's financial support and experience-sharing have allowed it to hire staff and get dedicated office space, and to carry out research which has demonstrated its value to policymaking. It has also allowed EAS to demonstrate the "convening power" of a science academy. In particular, it has been influential in helping the government to consider its policies on biotechnology, which lean heavily on EAS's recommendations.

This progress has allowed EAS to make a strong case for consistent, long-term support from government, multiplying the effect of ASADI's investment. The government sees a growing role for EAS in areas including the expansion of science education, the growth of astronomy and space activities, the expansion of agricultural research, and the development of an industrial museum. These developments may involve expanded government funding for EAS.

The result is that EAS has established itself as a trusted adviser to government, capable of challenging policy with objective evidence. There is now a memorandum of understanding with the Ministry of Health covering 10 key areas of EAS support for government, including immunization and demographic surveillance.

EAS now has a budgetary subvention from government and stable financial policies and procedures, as well as a resource mobilization strategy. This suggests that despite its small size, it has positioned itself for future sustainability. However, it does not yet have definitive long-term support from the government.

The Academy of Science of South Africa (ASSAf) is perhaps the most akin to a developed country academy in its funding model, with core funding from government alongside a wider range of funders for specific projects. EAS also received core government funding for the establishment of an academy endowment.

However, financial sustainability remains a challenge to these academies, and indeed to others around the world. UNAS recognizes it as a key issue. CAS makes the point that donors who part-fund projects, with the best of intentions, may not realize that it is a problem for the

academy to find matching funds, or to secure the resources needed to maintain the professional staff required for such projects.

## Strategy Development

Strategy development is important for academies because it helps with their thinking, planning, and execution; and because it 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 review panel would support. UNAS cites “potential donors and partners” as a key audience for its strategic plan, saying that the plan helps put it on an equal footing with other academies and networks in the eyes of external organizations.

The idea of strategic planning is not a new one for African science academies. Of the five main ASADI partners, only one, CAS, lacked a strategic plan at the start of the ASADI process. As box 3-3 explains, its introduction of strategic planning, supported by ASADI, has been widely noticed and is of national significance.

Of the remaining academies, even the newest, EAS, is a user of strategic planning. It reports that ASADI resources have allowed it to carry through its plan and to bring in more support for new activities. It also audits progress on the plan annually. Strategic planning was among the EAS’s first activities upon its foundation in 2010.

### **BOX 3-3 Cameroon: Strategy Development**

CAS has used resources made available through ASADI to develop its own strategic thinking, and in the process has helped to spread the idea of strategic planning to universities and research organizations in Cameroon.

ASADI financed the production of a strategic plan that articulates “the vision, mission, core values, and goals” of CAS. CAS has existed since 1991 and the idea of a strategic plan had been discussed before ASADI, but the small scale of its operations made this difficult to achieve.

The plan has been especially valuable because Cameroon’s public sector is based on the French model and respects bureaucratic processes. Indeed, the University of Yaoundé I, one of the country’s main centers for higher education, adopted the idea of a strategic plan as a result of the lead taken by CAS.

This higher level of planning has allowed CAS to be effective despite its small staff resources. Most of its work is carried out by the members and it is accepted that some members also work in staff roles, being paid to do so as project funding allows. This way of working has allowed CAS to produce three tangible outputs with substantial impact. They are a consensus study on *Onchocerciasis* research and its implications for control of this disease, which can cause blindness; a report on combatting Cameroon’s nutrition and health crisis; and a forum on food security in the Sudano-Sahel region of Cameroon.

The *Onchocerciasis* work has been acclaimed in and beyond Cameroon and has influenced *Onchocerciasis* control strategies. The food and nutrition activities have led to the launch of a new food fortification program backed by the United Nations Children’s Fund (UNICEF), and a national program on food security. CAS adds that the *Onchocerciasis* work also shows “that good science can come out of Africa.”

Because of the larger scale and greater maturity of the South African system, ASSAf is called upon to produce annual performance plans, quarterly performance reports, and other documents, including a “shareholder compact,” and all these documents are in the public domain. They are a legal necessity, but their completion adds significantly to the workload of senior ASSAf personnel.

A strategic plan written by an academy’s staff and members is also a way of asserting its independence from government, even if it has to be submitted to a government ministry. The Uganda academy adds that a properly structured strategic plan helps convince government that the academy is worth supporting financially. This might also apply to other donors and supporters.

Strategic planning was regarded as the second most successful ASADI activity by the African and U.S. academy participants interviewed for this report, with secretariat strengthening the biggest success.

### **Stakeholder Engagement**

ASADI’s main aim was to grow the ability of African academies to be advisers to government.

All five of the principal ASADI partners report progress in this area. There are improved relations with national and local government, and with a range of ministries including those responsible for science, finance, health, education, agriculture, and the environment. These links give the academies a new level of policy influence, and open up welcome new possibilities for funding and support. Some academies report good relations with the offices of cabinet members and prime minister or president. The building of personal relationships with people in government is a vital, and time-consuming, aspect of this process. NAS’s situation is described in detail in box 3-4.

Assessing the impacts of policy advice is not always easy or straightforward. The panel puts significant weight on the testimony of the government and other stakeholders who were interviewed during the site visits and who attested to the quality and influence of academy work. Each of the primary partners can cite examples of influential policy advice to government that are referred to throughout the report. CAS’s report, “Nutrition and Health in Cameroon: Combating the Crisis,” was influential in the government, UNICEF, and Helen Keller International launching Cameroon’s Food Fortification Program in 2011. The UNAS’s report on malaria has had a major impact on the country’s anti-malaria program. The EAS has helped shape national policy on biotechnology, an important part of its food and agriculture system. ASSAf has carried out many studies which have influenced policy, for example on revitalizing clinical research in South Africa. However, these initiatives have a range of financial support and are not all directly attributable to ASADI.

The presence of an effective academy can lead to the growing involvement of scientists in government roles, and this effect has been observed in Ethiopia. Several academies, including EAS, NAS, and ASSAf have been commissioned by government to carry out specific projects.

In addition, ASADI has enabled these academies to build relations elsewhere in society. This has meant better relations with universities and research institutes, with the private sector, and with NGOs and other civil society bodies.

NAS has built relations with business through which oil services company Schlumberger is supporting work in science education, while pharmaceuticals group GSK is backing an evidence-based health forum there.

Despite this success, these relations remain more problematic for the academies, and less strategically central, than their dealings with government. CAS, EAS, and UNAS report that this part of their portfolio remains underdeveloped. Building these relations is a long-term project that requires substantial member and secretariat resources, and these are not readily available to smaller organizations. UNAS is not yet recognized by statute, making its position in the Ugandan polity less secure than for the academies in South Africa and Ethiopia. NAS and CAS are also not recognized by statute.

#### **BOX 3-4 Nigeria: Engaging Government and Other Stakeholders**

NAS has used ASADI support to expand its ability to offer effective policy advice. This has involved growing its links with Nigeria's federal health and science ministries, and with its important state government structure.

The NAS secretariat has undergone what it terms a "significant upgrade over the years" of ASADI. This has led to "corresponding willingness to be engaged by local and international partners."

NAS's Integrated Disease Surveillance and Response activity is a case in point. NAS held a stakeholder meeting on this topic, and this was the first time that Nigeria's experts on human and animal health had discussed these issues together. NAS led this activity, and involved the ministries of health and of science and technology as participants.

NAS's increased capacity also allowed it to perform a 2012 analysis on breastfeeding in Nigeria. This project was supported by Save the Children, which asked NAS to carry it out as a respected and objective source of evidence-based advice. Its advice was one input to legislation on the provision of workplace crèches and is influencing discussion on maternity leave and on national food and nutrition policy.

NAS has also been an important source of advice to the Lagos state government's Ministry of Health, which is responsible for the wellbeing of 21 million people. The ministry initially supported the PREVIEW (Policy Research Evidence for Effective Working of the Nigerian Health Systems) initiative, which was designed to enhance the use of evidence in healthcare policymaking. As a result of its success, the ministry then established a fund for research to support policy development. There is a memorandum of understanding between NAS and the ministry, and there have been retreats at which ministry officials have been trained by NAS in the use of research evidence in policymaking as part of the PREVIEW project. A senior ministry official said that as a result of this positive experience, the ministry has "an open door policy relationship with the NAS."

#### **New Products and Activities**

The availability of ASADI funding has allowed the academies to generate a vast wealth of new products, activities, and outputs in areas such as science education, activities for youth and young scientists, public communications, and gender. Of these, the most central to ASADI's mission was the flow of consensus reports and other policy advice for government. As discussed

in chapter 2, the number produced far exceeded the target set at the start of ASADI. ASSAf's situation is described in box 3-5.

Other activities that ASADI has helped create include:

- A science journalism prize in Nigeria
- Public lectures on topics including biotechnology, agriculture, and nutrition
- In South Africa, a visiting distinguished fellows program and a science magazine for young people

Perhaps most significant is the vast expansion of externally-facing communications undertaken by the ASADI partner academies. Many now have improved and informative web sites, regular print and online publications, and a global presence in social media channels. In addition, their leaders are in demand as expert interviewees in the print and broadcast media. Several academy staff members interviewed for the review regarded external communications as the most successful ASADI activity after secretariat strengthening and strategic planning.

#### **BOX 3-5 South Africa: Products and Outputs**

South Africa has been shown (for example in the Thomson Reuters Global Research Report for Africa) to be the continent's leading producer of research. ASADI has helped ASSAf to ensure that its research is noticed and valued around the world. This is important because international visibility makes South Africa more attractive to globally mobile scholars, and to researchers seeking collaboration and joint working. It also reduces South African scholars' incentive to emigrate.

The mechanism for this process is the ASSAf Scholarly Publishing Programme, which began in 2006 with a consensus report on a Strategic Approach to Research Publishing in South Africa. ASSAf was asked by the Departments of Science and Technology and of Higher Education to implement its findings.

Support from ASADI made it possible to set up a peer review mechanism for accredited national journals. Publishing in them brings extra money to universities. Any South African journal indexed in the Web of Science database is automatically regarded as accredited in the ASSAf system, and other journals have been given five years to reach this level of international recognition. ASSAf's own publication, the South African Journal of Science, is itself indexed in the major world repositories.

ASSAf is now leading on wider African approaches to these issues, including the establishment of an open-access platform for South African journals.

This success has pointed to the need for qualified media professionals, and even media teams, in a modern academy of sciences. Tasks that need to be carried out on a regular basis include website maintenance, a flow of material into social media, a wide range of print publishing, media monitoring, the issuing of press releases, and the assurance of a consistent brand identity for the academy and its activities.

An additional initiative of several African academies that is closely tied to how science engages with society is the effort to foster and promote young academies. This was not an aspect

of the ASADI program, but rather an activity that several academies have taken the lead on. Young academies are self-elected bodies of outstanding young scientists, typically at the beginning of their independent research careers. Young academies and their members are interested in increasing the impact of science on policy, improving science education, and strengthening the research enterprise. The Global Young Academy was founded in 2010, and there has been a rapid growth in the number and activity of national young academies around the world.<sup>9</sup> The panel met with young academy members in Nigeria and South Africa. Ghana, Kenya, Zimbabwe, Sudan, and Egypt also have young academies. Other academies are supporting young scientists in other ways, such as fora.

These are all tasks that can be difficult to fund, especially because of the perception that media in African nations are uninterested in science. However, the fact that academies are close advisers to government on issues such as health, agriculture, and education means that there is scope for their communication activity to become steadily more influential and newsworthy. Success here will increase the importance of the academies in the eyes of government, of funders and partners, and of the public whose funds are used to support their activities.

### **Engagement of Members and Council Members**

Membership of a national academy is an honor extended to distinguished individuals. One measure of the academy's effectiveness is its ability to involve these people, who are inevitably busy, in its activities. NAS cites "lack of commitment to voluntary services by members" as one of its key challenges. This is an issue for academies around the world, not just in Africa. People who become academy members tend to have heavy workloads in teaching, research, management, and policy. And in Africa especially, even these important people can lack infrastructure support.

ASSAf used ASADI to support the introduction of human resources, audit, and executive subcommittees of its council, recognizing that these bodies would improve governance and make it simpler to comply with legislation. ASSAf points out that approximately 40 percent of its 426 members are involved in academy activity in some way, a figure which is impressive by any standard. However, as government and other stakeholders ask it to do more, the volunteer capacity of members available to ASSAf becomes a steadily larger issue. ASSAf and other academies also report that the gender and racial balance of academy members remains unsatisfactory.

NAS has a large and active membership. Members made the point that ASADI training in fields such as finance might have been extended usefully to members and council members. This would expand their skills, and would also allow them to take on a bridging role when staff left and replacements needed to learn about the academy's systems.

UNAS used ASADI to develop induction courses for new members, in the hope of diversifying membership further and increasing interest in the academy among possible members. It adds, too, that ASADI training in areas such as project management and academy business models would have been valuable. UNAS's expanded membership base has already allowed it to involve more members in volunteer activity. However, it regards member involvement as a continuing concern. It sees a need to involve more members in the search for new membership candidates, which might help expand diversity.

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<sup>9</sup> See <http://www.globalyoungacademy.net>.

The newest academy, EAS, has been expanding its membership to add to its expertise across the full range of subject specialisms. Its working groups, in fields such as technology or agriculture, are made up of members and are the basic functional unit of the academy. The EAS makes the point that working groups made up of members need staff input if they are to function effectively. This support is always a scarce asset and the EAS hopes to provide more in future years.

CAS, as noted elsewhere, faces a range of challenges. It is exceptionally reliant on its members to carry out most academy activities, including basic logistics and other tasks that would be carried out by staff in other organizations.

## **Regional and International Engagement**

ASADI promoted international discussion between the African academies with which it has worked, and has involved other partner academies such as the Royal Society, KNAW (Netherlands) and the Leopoldina (Germany) in this dialogue (see box 3-6). In addition to general discussion of best practice and program content, ASADI encouraged academies to provide training and other material help to each other. EAS suggested that capacity-building to help African academies to learn from each other remains an important issue. But this flow is not exclusively towards or within Africa. At least some lessons from the UNAS have been adopted by the USNAS.

One positive force for international discussion has been the Annual Meeting of African Science Academies (AMASA), which has been held in all five of the primary ASADI nations, and in Ghana, Kenya, Senegal, and the United Kingdom. These meetings have led the African academies into closer participation in the global inter-academy networks. There have also been over 20 ASADI workshops, almost all of which have drawn international participants.

While ASADI helped the academies to become more effective international organizations, most of their international activity understandably remains regional rather than global. UNAS reports that it has used technical and financial support from ASADI to build up its work with groupings such as the Network of African Science Academies (NASAC) and its participation in the AMASA meetings. Despite the cost of these interactions, it also intends to build closer direct links with other academies. CAS has similar experiences and priorities.

Of the larger academies, NAS and ASSAf have taken on a role mandated by NASAC to help grow academies in their respective regions of Africa (see box 3-7). ASSAf has used ASADI to raise its profile in Africa and around the world. It had decided even before ASADI that it wanted more international visibility, which it has now achieved. But it warns that this higher level of activity has called for more secretariat support than had been anticipated. ASSAf is on the Executive Committee of IAP, NAS and ASSAf are on the Executive Committee of IAMP, and NAS is on the Board of IAC, with the President of ASSAf serving as Co-Chair of IAC. Further examples of the improved international connections of the primary partners within and beyond Africa are given in the Evolution Tables which comprise Appendix I.

### **BOX 3-6 Capacity-Building Partnerships Involving African and Non-African Academies**

During the course of the ASADI program, several other efforts were launched to build the capacity of African science academies. While they are smaller than ASADI, they have focused on different institutions and topics, and should be seen as part of the broader story of how African academies have developed over the past decade.

#### IAP—The Global Network of Science Academies

IAP provides support for regional academy networks, including NASAC. It has supported NASAC's Capacity-Building Grants Program, in which modest grants are provided to individual academies to support secretariat capacity and information technology infrastructure.

#### Royal Netherlands Academy of Arts and Sciences (KNAW)

Starting in 2010, KNAW has undertaken a program to strengthen African science academies with support from the Ministry of Foreign Affairs of the Netherlands. Cooperation with NASAC has been central to the program. Activities have included a series of workshops on issues related to climate change, and focused work with several individual academies (Mauritius, Mozambique, Kenya, and the African Academy of Sciences). The involvement of young scientists has been a priority. In 2012, KNAW worked with the French and Swiss academies to organize a training workshop on communications for staff members of African academies. Although the program is ending, KNAW is looking for ways to continue working with African academies, most likely in partnership with other developed country academies and the European Academies Science Advisory Council (EASAC).

#### The Royal Society Pfizer African Academies Program

Started in 2009, the current program runs from 2012 under a five-year Memorandum of Understanding. Its scale is more modest than that of ASADI. Academy development is one of its emphases, alongside early-career development and UK/African collaborative research. Three African academies are involved, in Ethiopia, Ghana, and Tanzania. They have been supported to hold meetings and policy forums, to engage the public via science communications, and to enhance staff skill by training, secondment to the Royal Society, and other activities. One interesting finding is that effective policy interventions do not have to be expensive. A small meeting—or even a simple letter—can be surprisingly effective. It has been suggested that NASAC could be a repository for this type of learning from ASADI, the Royal Society Pfizer program, and other sources. This program has suffered from a lack of consistent funding, which highlights the benefits of long-term funding for academy development. The organizers also make the point that, as with ASADI training delivered in Washington, DC, secondments to the Royal Society need to have a specific remit agreed in advance if they are to provide long-term benefit.

#### German National Academy of Sciences Leopoldina

The Leopoldina's cooperative program with NASAC was launched in late 2011 and is projected to end in 2015, although there is some possibility of follow-up work. One major component of the program has been building the capacity of NASAC itself. Another focus has been the development of a series of reports for policymakers on water management, climate change adaptation, health and biotechnology. These are intended to enhance dialogues among NASAC, NASAC member academies, policymakers in African states, and other stakeholders such as the African Union and the UN Economic Commission for Africa. The Leopoldina program has also supported capacity building grants to about half of NASAC's member academies, which ran in 2012-2013 and 2013-2014. Another activity was fundraising training for staff from NASAC member academies held in August 2014.

**BOX 3-7 International and Regional Activity**

Most of the ASADI-supported academies have become capable of supporting new or nascent academies in other countries. This assistance has included “documentation on status and creation” of academies as well as workshops on academy creation, for example in Togo and Benin.

ASSAf has taken on a similar role in southern Africa, by agreement with NASAC. It has facilitated dialogue in Namibia, Angola, and Botswana on the possibility of establishing academies there, and has partnered with academies in Zimbabwe, Mozambique, Zambia, and Mauritius on academy development. NASAC has also asked the Nigerian academy to spearhead an academy development initiative in West Africa. Academies such as the German National Academy of Sciences, Leopoldina, have been involved in this activity.

## Lessons Learned

As the data catalogue that comprises Appendix C shows, the African Science Academy Development Initiative (ASADI) was heavily documented throughout its existence, and the review panel gathered a substantial volume of further material during the course of its work. It is worth adding that the process of writing this review itself fed into the academies in a positive way, especially through the interactions involved in the site visits.

This mass of evidence has allowed the panel to come to conclusions about what went right during ASADI, what might have been improved, and what it means for science academies and other organizations, both in Africa and beyond.

The first point to re-emphasize is that ASADI was a success. Nobody with whom the panel consulted disagrees with this overall finding. ASADI was also a unique activity, helping to build capacity at the level of individuals, institutions, and whole systems. It was transformative for all the primary academies, and especially the smaller ones. As is emphasized elsewhere in this report, the ASADI process lasted for a decade. Even without it, the primary academies would not have remained unchanged during this period. But the panel's conclusion is that this targeted intervention helped their development significantly.

This panel did not directly assess the cost effectiveness of ASADI or its various elements, which would be difficult even with additional time and resources for the review. And the statement of task for the review did not ask it to make such a judgement. While \$20 million is a significant amount, there are examples of capacity-building efforts aimed at African institutions of similar or even larger scale. For example, the Partnership for Higher Education in Africa, which was undertaken by a coalition of U.S.-based foundations, spent \$440 million on higher education institutions in seven countries between 2000 and 2010.<sup>10</sup>

However, the panel can state with confidence that the ASADI funds have had a long-lasting and positive impact on the academies in question and through them, on the systems of which they form part. Here some key questions about its effects are examined.

### **How did ASADI transform the primary partners?**

One key question concerns the initial condition of the academies before ASADI. Their Evolution Table entries confirm that they were too small to be effective, and some had a legal standing that restricted their ability to act. They had far less awareness of how to brand and position themselves with respect to major stakeholders, especially government, than they do today.

As a result of ASADI, they have become more influential with government, prioritizing areas in which they can have an effect and improving their knowledge of the policy process and their closeness to it. This has inevitably improved their standing in the worlds of policy and politics. In discussions, the Ethiopian authorities made the point that the value of a national academy of science goes beyond the use that is made of the advice it produces and the activities

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<sup>10</sup> Suzanne Grant Lewis, Jonathan Friedman, and John Schoneboom. 2010. *Accomplishments of the Partnership for Higher Education in Africa, 2000–2010*. New York: New York University. Available at: <http://www.foundation-partnership.org/pubs/pdf/accomplishments.pdf>

it carries out. The very existence of the academy, they told us, brings prestige to the nation and adds to its standing.

Nations that currently lack a science academy, or whose academy is currently less active than it might be, would probably appreciate this argument. There are now 19 academies in African nations (as evidenced by membership in the Network of African Science Academies [NASAC]), and the example of ASADI has encouraged their creation, so this lesson is plainly being learned. Conditions have to be right if a new academy is to succeed. If those conditions are not met, there is a risk of a new organization failing to meet its objectives.

### **Did ASADI make the case for academy capacity building?**

ASADI showed too that it is possible for a program of this type to have a positive effect on academies of widely varying history, mission, context, and size. An obvious case is the Cameroon academy, which despite being small (with very limited financial resources and only one member of administrative staff) has produced work on food security and health that led to the formation of a national food security program. The Cameroon Academy of Sciences (CAS) is now starting to produce consensus studies. It told this review group that it wishes it had been an ASADI intense partner from the outset.

A further example is Ethiopia. Here a new academy has been the subject of an Act of Parliament and has political support, thanks in part to the availability of a small amount of ASADI backing. The Ethiopia Academy of Sciences (EAS) is likely to become important because of the government's commitment to science and technology as national priorities, and because its council leadership is well-connected to government.

The improved credibility with policymakers earned by all the academies during the ASADI process was a theme stressed often to the panel. One of the Academy of Science of South Africa (ASSAf) stakeholders told the panel that it has built effective working relationships with several ministries, particularly the Department of Science and Technology. ASSAf's past production of policy-relevant work, much expanded by ASADI, forms the basis for these relationships.

Here and in all the other countries visited by the panel, it is apparent that the production of relevant, quality reports is vital to establishing the policy value of a national science academy. In addition, academies can make government aware of existing, high-quality research on emerging issues (water use was an example mentioned) of which hard-pressed ministerial offices might not be aware. This role will become more valuable if the academies broaden the range of government ministries they deal with, as some interviewees suggest will happen. While the science or health ministry probably has access to emerging research knowledge, other departments might not.

In addition, ASADI has helped academies to raise their visibility within their national scholarly communities. Examples include ASSAf's work on research publishing and on the future of the Ph.D. in South Africa. The Ph.D. work was well-received by government and by its science granting council, the National Research Foundation. It led to major changes in the allocation of funds for postgraduate study. A further report on clinical research led to new cash becoming available for clinical scientists. This success has added to the academy's standing in the university community.

These precedents suggest that the next stages of academy development beyond ASADI require careful planning if its legacy is to be maximized.

## Can academies influence public opinion as well as national policy?

Public engagement is becoming central to debates about the role of science in society, and there is growing emphasis on the importance of engaging decision makers, the private sector, civil society, and others in the co-production of knowledge. These debates have implications for how science is organized, supported, evaluated, and communicated, and academies will need to reflect this new emphasis if they are to be full partners in national development.

Academies of science around the world find it harder to build a reputation among the general public than with government. Part of the issue may be that distinguished scholars do not regard it as part of their mission to engage with the public, and fear that complex scientific messages will be oversimplified in debate. Public and media engagement also involve a time commitment from senior officers of the academy if they are to become a significant part of the academy's mission. It may be preferable to start a public engagement mission with activities, such as prizes and awards for high achievement, which both involve the public and bring in the energy of a broad spread of academy members.

This activity was not a specific ASADI priority and will need to be supported explicitly in future programs if public engagement is to be expanded. In addition, skilled support is needed on a continuing basis to ensure that websites and other resources are up to date and properly maintained.

One expert interviewee pointed out that in most of Africa, mobile devices are becoming the instrument of choice for information access. This means that African-oriented approaches to public engagement will be needed.

Related to this issue is the complex matter of academy relations with other civil society organizations. Again, this area of academy development was not explicitly funded by ASADI. It is an important and resource-intensive task that should be undertaken for many reasons, from fundraising to building support for the use of science in important national decisions. It is complex because it involves the building of trust and confidence before any tangible action can begin. However, academies exist to serve the whole of society, not only to speak to government departments. One positive example is the strong relations that many academies have built up with organizations concerned with HIV and AIDS. The Cameroon and Nigerian academies have been especially successful in building relations with nongovernmental organizations (NGOs).

An important area in which the ASADI-supported academies are already involved is the improvement of school science. This is obviously a good fit for the academies, as the education system is the source of future scientists. The Uganda National Academy of Sciences (UNAS) has been especially active in this area and ASSAf publishes a science magazine for school-age readers. This is a possible growth area for academies, to which a new funding stream might be attached. A further area of possible future growth is higher education, and an exemplar might be the Nigerian Academy of Science's (NAS) work on the country's medical education curriculum.

Many of the academies have had a focus on health in recent years, which is highly appropriate in the light of Africa's acute health challenges. But many also regard it as important to look at science more broadly in future, and to involve the social and human sciences in their work alongside the natural sciences, biomedicine, and technology. A broader remit would allow academies to connect to different areas of civil society, such as the manufacturing industry if there was to be a focus on engineering and technology. Once again, this diversification would require time, money, and people.

## **What lessons did ASADI generate about the internal development of science academies?**

Since ASADI was at heart a capacity-building operation, it is no surprise that it added to the capacity of the academies that it supported. But the first lesson of the ASADI experience is that the idea of capacity building conceals a number of specific challenges. In particular, it involves training and skills acquisition that are expensive in staff time and other resources. The panel was warned that it would be impossible for the more successful African academies to support others in need of capacity building unless they had substantial new funding for extra staff. The issue is about money, not the availability of skilled people. One welcome feature of ASADI is that it engaged people at a variety of levels within the partner academies, including administrators, finance teams, and program officers as well as senior personnel.

Training was perhaps the most important and impactful aspect of ASADI. However, the African academies remained in need of external help in some areas even at a late stage of the initiative. While all the academies wished to manage their ASADI awards, some made use of backstop financial management provided by the U.S. National Academy of Sciences (USNAS).

At least as important as the number of staff members employed by academies are their skills and qualities. In order for academies to increase their output of high quality products, they need staff members with writing skills, interpersonal skills to help manage volunteers in a consensus process, and the ability to contribute intellectually to projects when called upon. From the site visits, it is clear that the ASADI partner academies have achieved some success in developing and retaining such employees.

A specific issue in this context is the importance of the academy executive secretary.<sup>11</sup> While it is often stated that capacity should be built “from the ground up,” such capacity can be wasted or misused without adequate leadership. An example is Uganda, whose academy has gained from having an executive secretary who is recognized as a strong administrator. ASADI has also helped develop financial management at UNAS. However, it is recognized that UNAS has only made the progress that it has by means of a major effort.

These more capable and formal structures are themselves a cost and a resource drain. For example, some academies now have a formal personnel manual. This needs to be written and kept current, and could be shared to disseminate best practice. More attention might be given to ensuring that these back-office tasks do not absorb too much of the attention of senior people. Legislative requirements for information and for appropriate processes grow continuously, as do requirements for openness. These new demands are welcome, and fulfilling them is a core academy activity. But the work they generate may draw resources away from mainstream scientific concerns.

The growing expectations of academies mean that the senior people within them are subject to increasing pressure. As well as a demanding management role, they are responsible for relations with a broad range of stakeholders in government, education, business, civil society, the media, and other sectors. Important stakeholders want to meet someone senior, so this responsibility is not easy to delegate.

Many of the academies are expanding their membership, in numbers, but also in terms of the disciplines they cover. This will increase their visibility in the academic community, but there

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<sup>11</sup> The specific title for this position varies according to the academy. “Executive officer” and “chief executive” are also used.

are naturally limits to this process within a small nation. In any case, these new members involve a cost in terms of membership services. One academy indicated that the flattering experience of being elected to a national science academy is a useful way of keeping senior members of the national diaspora involved in their country of origin. Another added that it might have expected ASADI to put more resources into Young Academies. These by definition involve younger, and perhaps more energetic, individuals. They might also have a more representative balance of membership in terms of gender, race, and geographical location than the main academy, an issue frequently identified as problematic by the interviewees.

ASADI did not have a major focus on academy membership and council involvement. Future priorities in this area include member induction, the encouragement of voluntary involvement, and the involvement of relevant non-members in specific projects.

### **What has been learned about the financial needs of African academies?**

Financial security and flexibility are key to the autonomy of science academies. They recur as priorities throughout this report. The review revealed several key issues.

First, academies are by their nature organizations that need to exist and be effective over the long term and which require steady funding streams. Almost as importantly, they need predictable core funding if they are to have operational independence from government.

Next, finance is so important that academy members as well as managers need to be involved. Academies need high-level finance and fundraising champions, with a remit that involves bringing in money and diversifying the academy's sources of finance. Members should also take a lead in the management of endowments and other reserves and resources. While the academy president is vital, the treasurer is of almost equal importance.

African academies would naturally like autonomy and flexibility in the use they make of donor funding. This requires sensitivity among donors, which naturally have their own ideas about what should be done with their money. Donors need to be kept informed about the use and value of their donations, via a range of formal and informal communications channels including full financial accounting.

In the case of ASADI itself, for example, the academies would have liked more responsibility for handling their own funding, and some felt that the processes adopted slowed things down. However, it is also true that some academies needed assistance in managing their ASADI funds.

### **What features of the African policy and science environment most affected the ASADI process?**

A further lesson is that many African nations, even larger ones, have a sparsely-populated policy landscape by international standards. They do not have the dense ecology of think tanks and policy bodies found in the capital cities of the developed world. Part of the rationale for ASADI was to grow the capacity of the academies to supply evidence-based insights to enhance national thinking about health and sustainable development.

The panel has learned that this approach works. These strengthened academies have become an effective route for scientific and medical evidence to affect policy thinking. Many influential examples could be cited. The Nigerian academy's evidence on vaccination has been significant because of the importance of vaccination in its own right and more broadly because vaccine delivery is regarded as a measure of the effectiveness of a health service. Again in

Nigeria, the academy has used its links into NGOs and higher education to influence the national debate on health insurance.

However, policy advice has to be given at the right point in the policy process. The consensus approach can make it difficult to work to an external timescale. This suggests that there could be occasions when different and more flexible policy advisory tools would be appropriate. In any case, experience from around the world shows that the differing expectations and timescales of the research and policy processes are a universal problem.

Even after ASADI, these academies are small organizations with limited capacity. They often rely on project funding to survive, and can be forced to lose staff or retrench severely at the end of a specific project. At the end of the ASSAf pilot project on scholarly publishing, ASSAf avoided losing staff but was forced to curtail many of its activities to continue the scholarly publishing program. It has since brought in new baseline money from government to fill this gap and re-established a full range of activities.

Endowments are a key issue for all these academies, providing resources that an academy can use without reference to the needs of a specific project. The Nigerian and Ethiopian academies already have endowment funds provided by their governments. But this route is more difficult in smaller economies. In addition, the governments of some countries may not allow organizations to build up large surpluses of public money, so that endowment funds would need to be raised from private sector entities such as foundations, companies, and wealthy individuals.

This point reemphasizes the fact that these academies have only limited organizational and financial independence. One possible approach to future development might be to support the post of fundraiser within some chosen academies for a specific period, with the proviso that the individual would be expected to become financially self-supporting at a specified point in time. Councils and other prominent members can also make a significant contribution to fundraising efforts.

Finally, some of the African academies did state that they found ASADI's approach lacking in cultural sensitivity on occasion, although they overwhelmingly welcomed ASADI and regarded it positively. Future capacity building initiatives of this type can and should be African-led. They might also gain from more advance thinking about their style and ethos, and about whether it is possible for decision-making to be brought closer to the end user. It is likely that these issues of accountability and control will continue to arise, and that academies and donors will need to address them further in future.

## 5 Beyond ASADI

The purpose of the African Science Academy Development Initiative (ASADI) was to build the capacity of African science academies. Its success means that the nations whose academies were supported now have an improved national source of evidence-based knowledge for policymaking and other purposes. At the same time, the academies involved in ASADI are more capable than before of stressing the role of science in national life, for example in education, in health provision, and in decisions on development. In addition, they are better placed to assist in the growth of academies in other countries.

These changes are all positive, and this chapter will explore ways of building on them. But capacity building such as that supported by ASADI does not happen in isolation. A science academy's capacity to be effective depends in part on its internal organization and resources, and these were the main emphasis of ASADI. But an academy's links to stakeholders and the wider society are also a vital part of its competence. Some of these capacities, such as links to government, are well-established academy priorities. Others such as media and external communications remain underdeveloped and are priorities for the future.

### POSSIBLE SUCCESSORS TO ASADI

There is certainly scope for a successor to ASADI, perhaps with an emphasis on expanding African academies' capacity for policy development. The original mission of ASADI in capacity building for African academies also remains valid.

The panel would regard a new capacity building activity as a worthwhile commitment for donors such as the Gates Foundation, and for delivery bodies such as the U.S. National Academy of Sciences (USNAS) and Institute of Medicine. This support could include academies not involved, or not centrally involved, in ASADI, but might omit the Nigerian Academy of Sciences (NAS) and the Academy of Science of South Africa (ASSAf) as ASADI-graduated organizations. It might involve support such as continued technical guidance, help with connections to potential funders, undertaking collaborative continent-wide studies, and other projects.

One question that the panel considered is what science academies should aim to look like in contemporary Africa. One possible model would be to aim for the same level of power and influence as bodies such as the Institute of Medicine in the United States or the Royal Society in the United Kingdom. These are influential organizations with powerful committee structures capable of making nationally important interventions. The originators of ASADI regarded this as an attractive model in the planning phase of the project.

This objective, however, may not be realistic for some African academies, at least in the short term. One size does not fit all with academy models, and flexibility is needed in structure and operation. All of the intensive partner academies have made significant strides in becoming more visible and influential voices in national policy discussions, but have taken somewhat different approaches depending on their capabilities and policy contexts. ASSAf, for example, has delivered a series of influential consensus reports on issues such as Ph.D. production and treatment of HIV and AIDS. NAS has employed an approach that relies more on direct outreach and assistance to frontline officials and others in fields such as public health, as illustrated by its

recent activities aimed at controlling and ending the recent Ebola outbreak.<sup>12</sup> As African academies evolve, and scientific activity on the continent expands, the models of what these organizations can and should be will undoubtedly change, and will likely continue to exhibit a significant degree of diversity.

At the same time, a science academy is inherently an international organization in terms of the contacts it maintains and the networks to which it belongs. It can help make individual scientists more outward looking by involving them in national and international cooperation and debate. It can also be a useful point of contact for diaspora scientists who retain an interest in their nation of origin.

African academies already adapt to the national contexts in which they find themselves. In Ethiopia this has included having memoranda of understanding (MoUs) with government ministers on the nature and form of work that is required of them. In Uganda, the academy has been commissioned to convene committees of key national institutes such as the AIDS Commission. In South Africa, ASSAf crafted its strategic plan to align with national strategic priorities outlined by the government.

## RESOURCES FOR AUTONOMY

The point was made repeatedly that African science academies need their own independent resources to carry out their missions successfully. The western model, for example, involves academies receiving substantial government and donor support, but at the same time having endowments and other funds that allow them to make their own decisions about specific projects and about their overall strategic direction. Even then, these academies are often short of resources.

One possible academy activity that could perhaps generate a surplus is publishing, of both scholarly and popular material. This activity is aligned with the academic and public-facing objectives of a science academy. However, significant resources are required to launch and sustain a scholarly publishing operation, and many African academies are not large enough to consider such a move. Uncertainty about long-term trends in the business of research publishing and the ability of journals to generate income constitute another reason for academies to exercise caution in moving into this arena.

This suggests a twin-track approach to the funding issue. On one track, governments need to learn that they get the best results from academies that receive core funding without a high level of political direction and interference. On the other, academies need to build up assets independently of government. This obviously requires them to become better fundraisers, but over time would also need them to develop management structures to manage their endowments. One academy put it that “fundraising champions” are needed in all these organizations.

Part of ASADI’s success has been the growing ability of academies to bring in fresh funding from their own governments. While this money might arrive with political strings, it was also pointed out to the panel that global aid agencies and nongovernmental organizations (NGOs) also have their own agendas and restrictions, such as the U.S. Agency for International Development’s (USAID) restrictions on funding activity that might be regarded as supportive of abortion.

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<sup>12</sup> “Ebola: Academy Educate Hotel Owners On Preventive Measures,” *Leadership*, September 25, 2014. Available at: <http://leadership.ng/news/385199/ebola-academy-educate-hotel-owners-preventive-measures>.

The overall lesson is that in countries with a small policy community, it might be unreasonable to expect as much distance between government and the academies it supports as the U.S. or European model might imply. The implications for future African academies are still to be explored. In addition, the policy structure of many African nations is changing and developing fast, so that this picture will change over time.

### **A CALL FOR LEADERSHIP**

This rapid rate of change emphasizes again the importance of academy leadership. One ASADI participant pointed out that “all academies walk a fine line with their sponsors.” So leaders are needed who can “speak truth to power” without jeopardizing future funding, and who appreciate the nuances of how an uncomfortable message should be communicated. Like the fundraising champions mentioned earlier, these people need to be sought out and developed. A future development initiative in this area might be one way ahead.

Another area for future development is the strategic planning capacity of academies, as a valuable process for the academy itself and for its national and international audiences. While the ASADI academies have become good at writing plans, it is less clear that such plans have been monitored or evaluated during their lifetime or later. They sometimes lack stated initial targets that can be tracked and monitored during and beyond the project. A more results-based approach with broader use of quantitative metrics to track strategy implementation might allow other actors, such as civil society organizations, to work more closely with academies and to see their value.

This shows that ASADI might have given more advance thought to the detailed needs of the African academies before it started work. It could also have used a shorter time frame for some of its funding. While long-term support is needed for big change such as that delivered by ASADI, more use could have been made of specific targets leading to the release of subsequent tranches of money. This would have connected the partners more closely to the grant-awarding body.

This raises the issue of member and council activity more generally. It is a common theme that as academies grow and become professionalized, their members’ enthusiasm for voluntary activity can fall. As one academy member put it, “People want to review reports, but become less keen to write them.”

One key to this is to broaden membership, as seen in the last section. In the longer term, it might also be possible to involve experts who are not (or not yet) academy members more intensely in their areas of special expertise. The growth in secretariat capacity, for example in the production of reports, is a positive step and should make member participation simpler in the long term.

### **DIVERSITY OF PRODUCTS**

As discussed elsewhere in the report, ASADI began with the intention of building the capacity of partner academies to produce consensus study reports as a primary policy advisory mechanism.<sup>13</sup> Over time, the academies and ASADI learned that other sorts of products could be

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<sup>13</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,

valuable within the various national policy contexts. In addition, substantial resources are needed to undertake high quality consensus studies, implying that smaller academies might find it difficult or impossible to make their production a core activity.

In the future, there might be new forms of engagement with policy. For example, academies might convene expert groups that accept the possibility of a national consensus not emerging on some problematic subject. The Nigerian academy has already taken some steps in this direction, and going beyond the consensus report model. The current Ethiopian approach is to use consultants to draft academy reports which are reviewed by academy members before going to the government. Development and sharing of new approaches could be a focus of future capacity-building efforts.

It is also worth noting that African societies and nations are changing fast. This means that their academies, too, cannot stand still. Several of the ASADI academies pointed out that they receive more requests for advice than they can cope with. They are already seen as more objective than international consultants or NGOs.

However, most of the work that academies now carry out for government is in the field of “science for policy” rather than “policy for science,” to use a classic distinction. Governments are less keen to be told how they should organize the national science effort, or how much they should spend on it, than they are on advice about the latest scientific knowledge. Effective intervention here is a further area of possible future development.

It is our conclusion that these academies can become more relevant, more effective, more interactive, and better-resourced. The people who run them appreciate this. More complex, perhaps, is the issue of their future organization on a global and African scale, and of the management and ethos of their future capacity-building.

## **AFRICAN PRIORITIES**

Academies of science in the west now interact with their African colleague organizations on a far more equal basis than in the past, stressing mutual rather than one-way learning and support.

This suggests that if future development initiatives are to be as successful as ASADI, their priorities and leadership will have to come from Africa, specifically from African scientific communities and the societies of which they are part. The growing level of South-South science cooperation in and beyond Africa means that this important ambition can now be fulfilled.

During the ASADI process, several academies did push back against some of ASADI's suggestions for their future direction. So expectations need to be managed on all sides in future programs. An example is Ethiopia, whose academy is highly connected to government, and where an academy member has carried out the world's biggest study of bipolar disorder.

This example shows that these organizations are already generating their own model of what an African academy should look like. While there is room for diversity in the shape of future African academies, two key elements are that they will have independence to investigate and prioritize subjects of scientific importance, but will interact closely with national political systems as a trusted supplier of useful, high-quality, peer-reviewed insights.

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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.

## INTERNATIONAL COOPERATION

Because knowledge is universal, an academy is inherently an international organization. The need for academies to work together and support each other, possibly via some larger African organization, was emphasized by many of the experts whom were interviewed during the review process.

As already stressed, this report is a review of ASADI, not of individual academies, and certainly not of the people within them. By the same token, it is not a review of international academy organization. Instead, it seeks to offer a few pointers towards the future role of international and multinational organization for African science academies.

Both academy experts and external participants in this review called for improved international working by African academies, and by their partner bodies in the North. Existing international networks such as the InterAcademy Partnership (IAP) and the InterAcademy Medical Panel (IAMP) are already very valuable for individual scientists and for academies, and can help develop academy members as ambassadors for science in Africa. Academies also have a role as credible voices for policy advice to continental organizations.

There are currently a number of bodies that represent African science on a continental scale, notably the Network of African Science Academies (NASAC)<sup>14</sup> and the African Academy of Sciences (AAS).<sup>15</sup> AAS has official recognition from the African Union Commission (AUC), giving it high-level influence on a continental scale. NASAC was founded a few years before the start of ASADI, so NASAC and ASADI have both had the task of building up the idea of academies as valid institutions for Africa. NASAC hopes to have 21 member academies by the end of 2014. It envisages an enhanced role for itself in light of ASADI's success, but agrees that it continues to face organizational and financial challenges, as well as political ones such as relations with the AUC.

ASADI participants interviewed for this review make the point that mutual assistance by African academies is perhaps their most vital international activity. As one interviewee told the panel, only Nigeria and South Africa have fully developed academies. All the others need to work together to accumulate critical mass. They could cooperate to improve their publications, their relations with government, their fundraising, and their links to industry and civil society.

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<sup>14</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 include 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>15</sup> The African Academy of Sciences (AAS) is an Africa-wide individual membership-based scientific organization, with a view to honoring internationally renowned African scientists and also to encouraging the development of the research and technology base throughout Africa.

## **CONNECTING ACADEMIES**

A specific priority for NASAC might be to act as connective tissue for the academies, strengthening their reach and influence. For example, it might use its current website as a repository which would allow academies across Africa to present their work and their expertise to the world at large. Many of the reports and documents they produce are of global interest. Broader visibility would add to their national and regional influence.

NASAC could also take on the role of raising the profile of the academies within bodies such as the African Union (AU). This would involve building on the success of the Annual Meeting of African Science Academies (AMASA), and of the continental-scale studies that academies are now producing, for example on tobacco control.

A development of this activity might involve the academies in the provision of distance or presence training. This is a field in which there is massive need across Africa, and this activity might be run to generate a financial surplus. ASSAf is already involved in training young scientists in science writing and communications. This activity is a possible precedent for further expansion. Some past training delivered to academy staff by commercial trainers has been inappropriate in content and language, perhaps because of the trainers' orientation towards private sector clients. This suggests that there are opportunities for academies to build on ASADI's work in training academy staff, and to extend this activity to the broader scientific community.

It seems certain that health will continue to be a major concern for the African academies. Health ministries are almost as big a point of reference for their work as science ministries. Academies already provide training for health professionals, carry out consensus studies on areas such as child health and tobacco use, and act as centers of expertise in fields such as HIV and AIDS, malaria, and immunization.

The future of this activity will change as African health priorities change. But academies will continue to be valuable sources of objective information in a field where there are competing claims for resources and competing ideas about disease and health. This has led to ASADI-supported academies housing national organizations on vaccination, malaria, and HIV and AIDS, such as the Uganda AIDS Commission, and ACVI, the Ugandan Advisory Committee on Vaccines and Immunisation.

The academies' ability to negotiate these issues suggests that they might become trusted advisers to government and broader society on other tricky issues on which consensus is hard to reach, perhaps including science education or climate change. The Ethiopian academy's influential work on biotechnology might be a precursor for this wider activity. A further agenda of activities in areas such as water, food, and climate might be developed in the light of the United Nations' (UN) current effort to identify Sustainable Development Goals (SDGs) as a successor to the Millennium Development Goals (MDGs) established in 2000.

## **REGIONAL STRUCTURES FOR AFRICAN SCIENCE**

One question concerns the scope for NASAC to grow its activities across Africa. There is general agreement that the existing NASAC would need more resources to carry out the wide range of African academy-building activities that can now be envisaged.

A possible approach would be to strengthen NASAC while supplementing it with new regional structures. This would acknowledge two realities: the sheer size of Africa, and the fact that the larger academies are already leaders in their respective parts of the continent. This structure would give them a more formal regional responsibility for academy development, and a role in regional and continental policy development. This might include suggesting subjects for future policy studies and consensus reports.

Of special importance is AMASA. This meeting is valuable for several reasons. One of the most significant is that it allows African scientists to meet and plan. As one interviewee told us, this implies “shifting the center of scientific leadership” towards Africa. On this theme, the importance of a major annual event for national academies was also stressed to us, as a way of making the academy visible to politicians, funders, scientists, and the public, and of increasing its self-confidence.

Another related area for development is the global visibility of African scientists. To achieve this, the academies will need databases of their members’ expertise, as well as networking and media skills to grow their presence within and beyond Africa. There might well be scope for studies of science-related issues on a continental African scale, emphasizing the value of scientific advice to national governments and to the AU, including New Partnership for African Development (NEPAD) (an AU strategic framework for pan-African socio-economic development, providing a vision and a policy framework) the AUC and the UN. African and global policy development, implementation, and monitoring and evaluation around issues such as the MDGs and SDGs, and disaster risk reduction would benefit from stronger scientific input.

In addition, there might be scope for a regular meeting of academy chief executives as a leadership group for the implementation of academy development and for the development of NASAC and other cooperative structures. This might be useful from a continuity perspective as well as offering opportunities for networking.

All of these ideas would need to be planned strategically, supported, and then monitored and evaluated over time. This would involve the academies themselves in their own capacity-building and their own planning for sustainability.

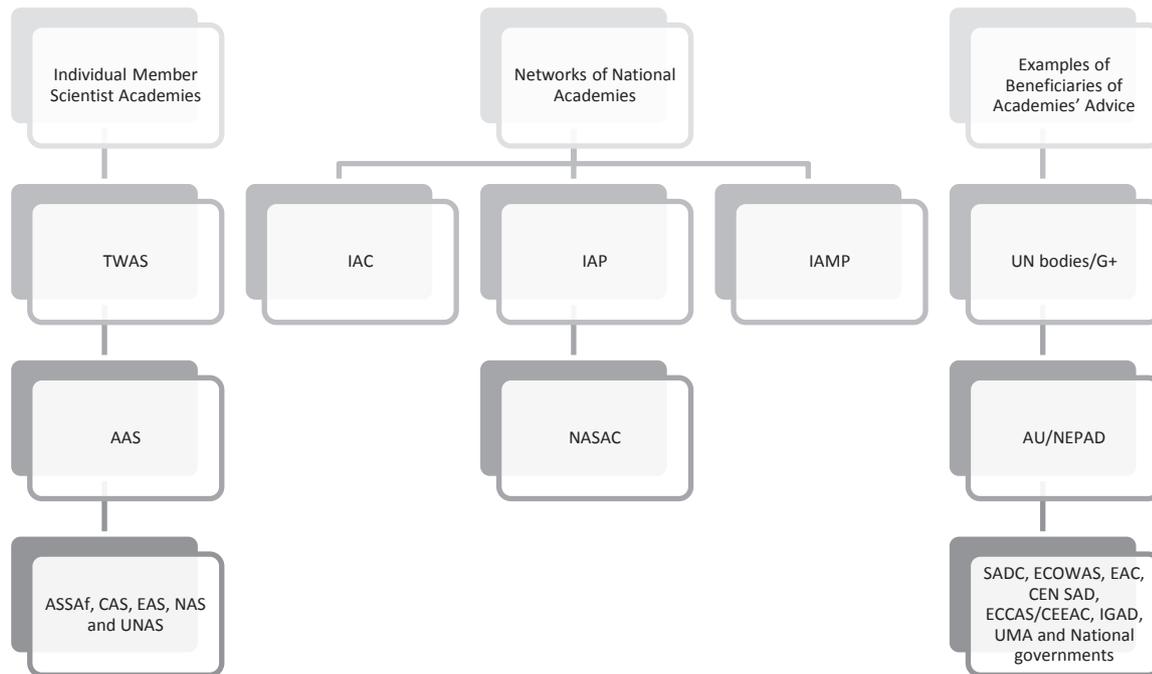
Strengthened bodies such as these are needed to represent the growing number of African scientists. The increasing number of world-class research centers and universities in Africa means that there are steadily more individuals capable of taking on national or continental roles as visible scientists. Modern technology makes it affordable for them to work together on policy issues as well as scientific ones, given an organizational framework that allows them to do so. Because of their links to governments across Africa, national academies will continue to be important players in this new landscape. For one thing, it is their role to remind governments of the AU target that they spend 1 percent of gross domestic product on research.

The growing scope and importance of African science mean, too, that African scientists and science academies will have a bigger say in the shape of the world scientific enterprise in future years. They will be participants in the setting of scientific agendas, not passive recipients of priorities decided upon elsewhere.

In addition, there are still African nations which lack an academy of science. Successful academies, and representative bodies such as NASAC and the AAS, have a key role in demonstrating the value of an academy to a modern African nation and in building support for its establishment. Setting up an academy involves gathering funding, gaining political backing, possibly including primary legislation, and getting staff and space. It also calls for commitment from senior people, who are needed to occupy key positions such as president and treasurer.

ASADI has already shown that small, new academies can be effective national and international organizations. In their next phase, they are likely to link with development organizations, education systems, and other poles of influence, while deepening their links to national and international policy processes. The academies of Nigeria and South Africa are already doing this, taking advantage of these countries' large pools of scientific talent. This is a long process that becomes simpler with the help of others who have travelled the same road before. That was the original aim of ASADI, and the panel sees every reason for further academy development within Africa to adopt the same ethos.

**Figure 5-1** The International Structure of Organizations Relevant to African Science



Note: TWAS=The World Academy of Sciences; IAC=InterAcademy Council; IAP=IAP—The Global Network of Science Academies; IAMP=InterAcademy Medical Panel; AAS=African Academy of Sciences; NASAC=Network of African Science Academies; AU/NEPAD=African Union/New Economic Partnership for Africa's Development; ASSAf=Academy of Science of South Africa; CAS=Cameroon Academy of Sciences; EAS=Ethiopian Academy of Sciences; NAS=Nigerian Academy of Science; UNAS=Uganda National Academy of Sciences; SADC=Southern African Development Community; ECOWAS=Economic Community of West African States; CEN SAD= Community of Sahel-Saharan States; ECCAS/CEEAC=Economic Community of Central African States/Communauté Économique des États de l'Afrique Centrale; IGAD= Intergovernmental Authority on Development; UMA= Arab Maghreb Union.

## 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 policymaking. 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 AMASA<sup>16</sup> and 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 USNAS 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

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<sup>16</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.

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, valuable service for their societies in the coming years. They have the potential to be recognized as strong, independent institutions, built on 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. It is important to note that implementing the recommendations described below will require additional resources. Resources are always limited, so choices will need to be made and priorities set. Still, the African academies and their stakeholders and partners on the African continent and around the world have proven capable of launching initiatives, and can make a strong case for support.

1. African academies of science,<sup>17</sup> 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 executive and staff;
- membership and election procedures;
- strategic planning, project management, and peer review;
- financial management and accounting systems;
- communications, outreach, and media relations;

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<sup>17</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.

- 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 to enhance the effectiveness of individual academies and empower science and science advice at the African 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 AU, 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 relations 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 in 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 which are strategic and/or complementary, and based on shared values;
- acting as a bridge between national and regional scientific communities, policymakers, 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 AMASA meetings and 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 the 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.

## Appendix A

### Bio Sketches of Panel Members

**Turner T. ISOUN** (Chair), was the Minister of Science and Technology of the Federal Republic of Nigeria from October 2000 to May 2007. During his tenure, he initiated policies that promoted both high-tech and low-tech science for development. He guided space policy and the projects, NigerSat I (a land observation satellite), and NIGCOMSAT 1 (an advanced communication satellite), through development and launching. He directed the development of policies for a wide range of S&T sectors. Following his tenure as Minister, Prof. Isoun was awarded the Nigerian National Honour of the Commander of the Federal Republic of Nigeria (CFR) in 2007. He was previously the first Vice Chancellor of Rivers State University of Science and Technology, and was Professor and Head of the Pathology Department at the University of Ibadan. His research and teaching focused on tropical pathology, nutrition and disease. He earned his Doctorate in Veterinary Medicine (DVM) and Ph.D. in Veterinary Pathology from Michigan State University (USA). He is Fellow of the Nigerian Academy of Sciences (NAS) and Fellow and Executive Member African Academy of Sciences. Prof. Isoun recently published a book: *Why Run Before Learning to Walk? Reflections on High Technology as a Strategic Tool for Development in Nigeria*.

**Mostapha (Mosto) BOUSMINA** is a physical chemist and rheologist working on nanomaterials and nanotechnology. He is presently the President of the Euro-Mediterranean University of Fez-Morocco, Chancellor of the Hassan II Academy of Science and Technology-Morocco, and President of the Network of African Academies of Sciences (NASAC). From 2008 to 2011, Prof. Bousmina was the Director General the Institute of Nanomaterials and Nanotechnology (INANOTECH), Morocco. Before that he was Professor and the holder of the Canada Research Chair on Polymer Physics and Nanomaterials at Laval University, Quebec-Canada. His research has focused on the physics of polymeric multiphase systems, and nanomaterials. He earned his engineering degree at Ecole d'Application des Hauts Polymères (EAHP, School for Application of High Polymers), and completed his MS.c and his PhD at the Louis Pasteur University, Strasbourg, France in collaboration with the University of Illinois-Chicago, USA. He is a Member of TWAS: The World Academy of Sciences, and of the African Academy of Sciences

**Heide HACKMANN** joined ICSU as Executive Director in March 2015, following eight years as Executive Director of the International Social Science Council. Heide read for a M.Phil in contemporary social theory at the University of Cambridge, United Kingdom, and holds a PhD in science and technology studies from the University of Twente in the Netherlands. She has worked as a science policy maker, researcher and consultant in the Netherlands, Germany, the United Kingdom and South Africa. Before moving into the world of the international councils, Heide worked as Head of the Department of International Relations and Quality Assessment of the Royal Netherlands Academy of Arts and Sciences. Her career in science policy dates back to the early 1990s when she worked at the Human Sciences Research Council in South Africa. Heide holds membership of several international advisory committees, including the Scientific Advisory Board of the Potsdam Institute for Climate Impact Research in Germany, and the Swedish Research Council's Committee for Development Research, Sweden. She is a Board member of START, as well as Cape Farewell in the UK.

**Anne MILLS** is Vice-Director of the London School of Hygiene & Tropical Medicine, and Professor of Health Economics and Policy. She has researched and published widely in the fields of health economics and health systems in low and middle income countries and continues to be involved in research on health insurance developments in South Africa, Tanzania, India and Thailand. Prof. Mills has had continuing involvement in supporting capacity development in health economics in universities, research institutes and governments. She has been involved in numerous policy initiatives including WHO's Commission on Macroeconomics and Health and the 2009 High Level Taskforce on Innovative International Finance for Health Systems. She received her first degree in history and economics from the

University of Oxford, holds a postgraduate diploma in Health Service Studies from Leeds University, and earned a PhD in health economics from the University of London. Professor Mills has a CBE for services to medicine, is a Fellow of the Royal Society of London, a Fellow of the UK Academy of Medical Sciences, and a Foreign Associate of the US Institute of Medicine.

**MU Rongping** is now Director-General and Professor at the Institute of Policy and Management at the Chinese Academy of Sciences (CAS). He is also Director-General of the CAS Center for Innovation and Development, and Editor-in-Chief of the Journal of Science Research Management (an academic bimonthly). Dr. Mu joined CAS in 1990, and previously taught at Hefei University of Technology from 1983-1990. His research interests include science, technology and innovation policy, technology foresight, R&D management, and the competitiveness of high-tech industries. He has published more than 30 papers in peer-reviewed journals and international conferences, and drafted documents concerning China's National Innovation Policies and the 11th Five Year Plan for National Capacity-Building for Innovation. Dr. Mu received his B.S. (1983) and M.S. degrees (1990) from the University of Science and Technology of China, and his Ph.D. degree (2001) from Technische Universität Berlin, Germany.

## Appendix B Use Made of ASADI Funds by the ASADI-Supported Academies

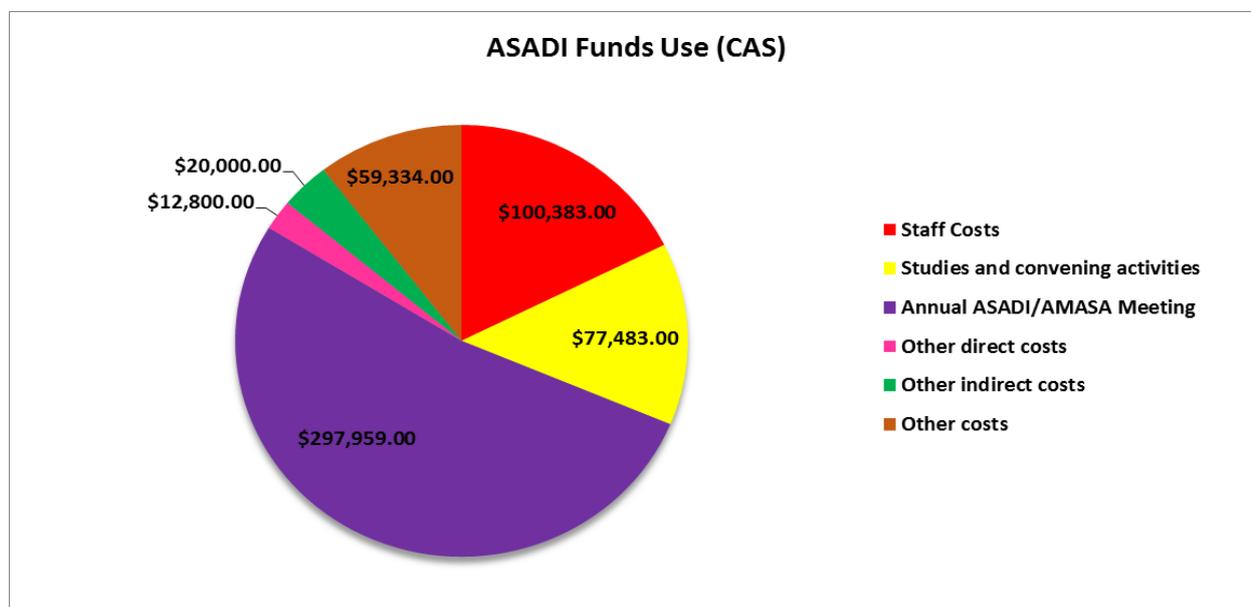
Use made of ASADI funds by the primary partners. All sums here and elsewhere in this report are in US dollars.<sup>18</sup>

Summary:

<u>Description</u>	<u>Amount</u>
Oversight	4,031,387.99
Annual Meeting and Learning Collaboration	2,751,277.09
Evaluation	770,076.03
CAS	383,227.71
GAAS (Ghana)	66,021.77
KNAS (Kenya)	62,300.52
NAS	3,572,846.28
ANSTS (Senegal)	62,555.36
ASSAf	2,520,504.80
UNAS	4,403,062.29
EAS	355,528.03
AAS	41,488.93
Partnership Development (Yr 1)	979,723.20
<b>Total:</b>	<b>20,000,000</b>

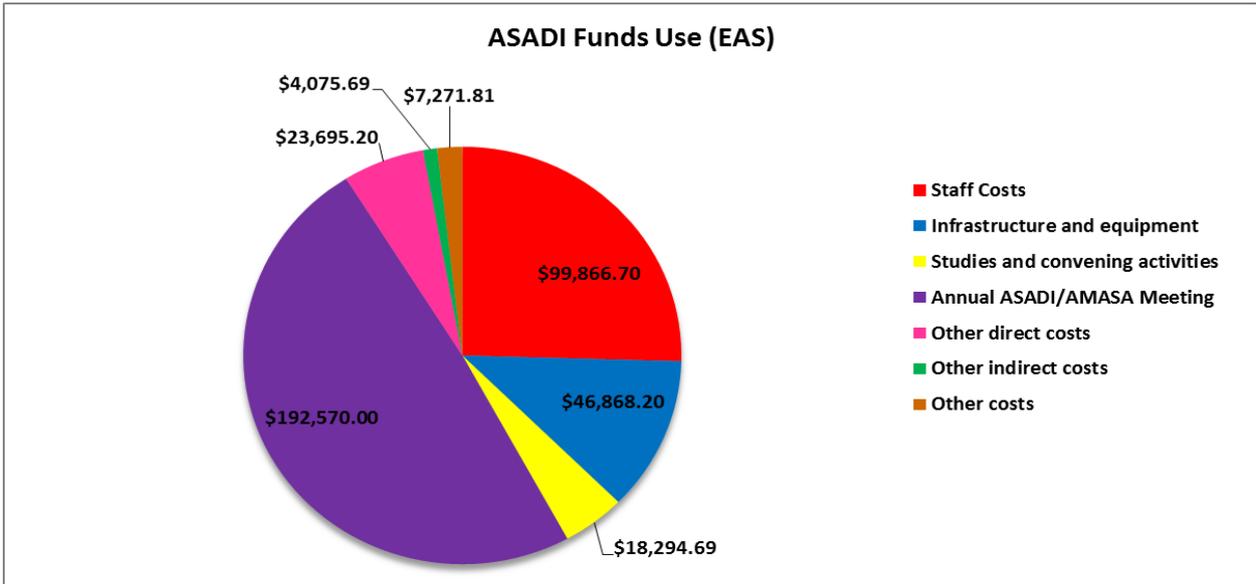
Source: ASADI

Note: Does not include funds from interest earned on the award that supported ASADI-related activities during 2015.

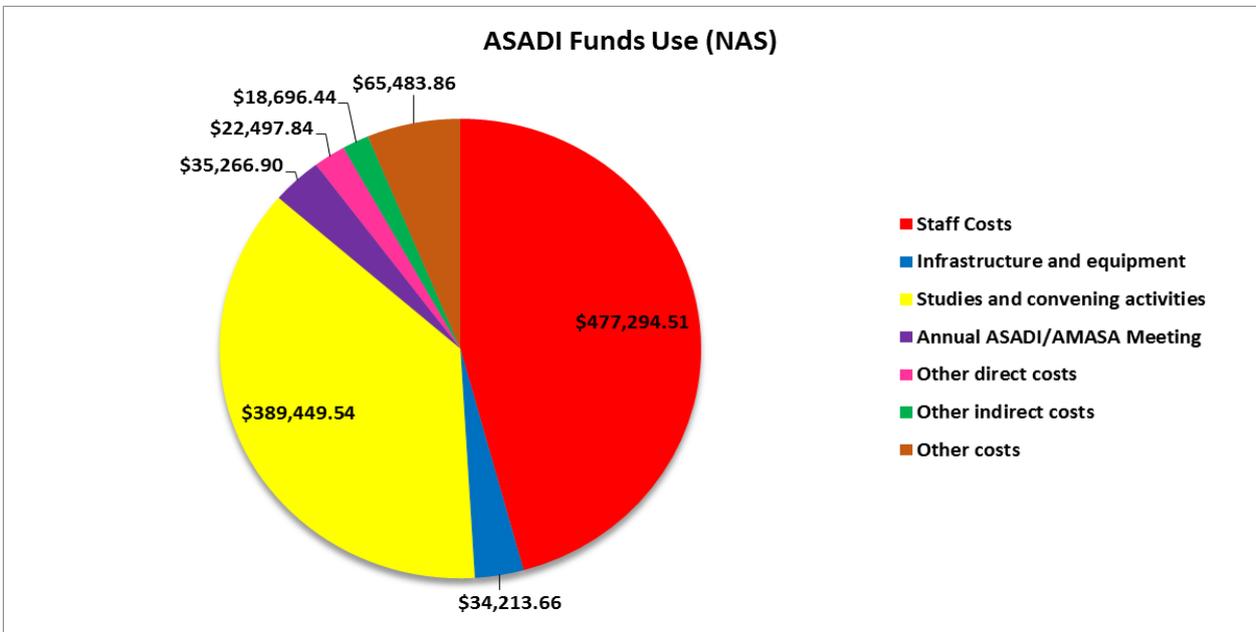


Source: CAS

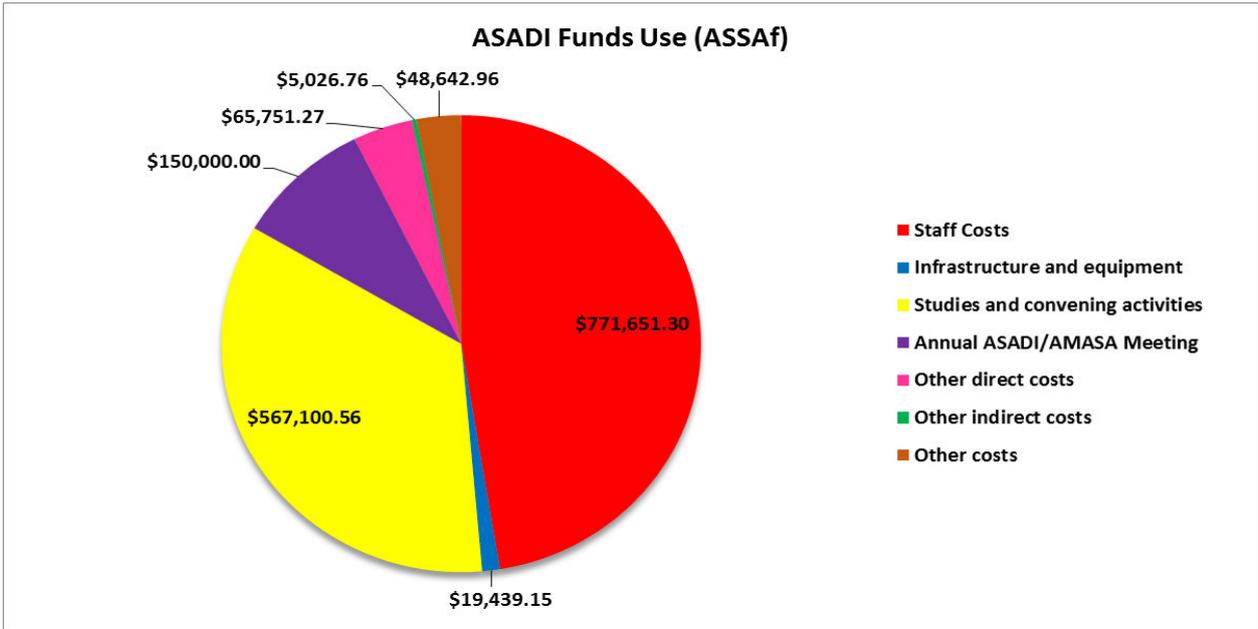
<sup>18</sup> Amounts reported by ASADI and by the African academies may differ due to the timing of payments and reporting, differences in exchange rate accounting, and for other reasons.



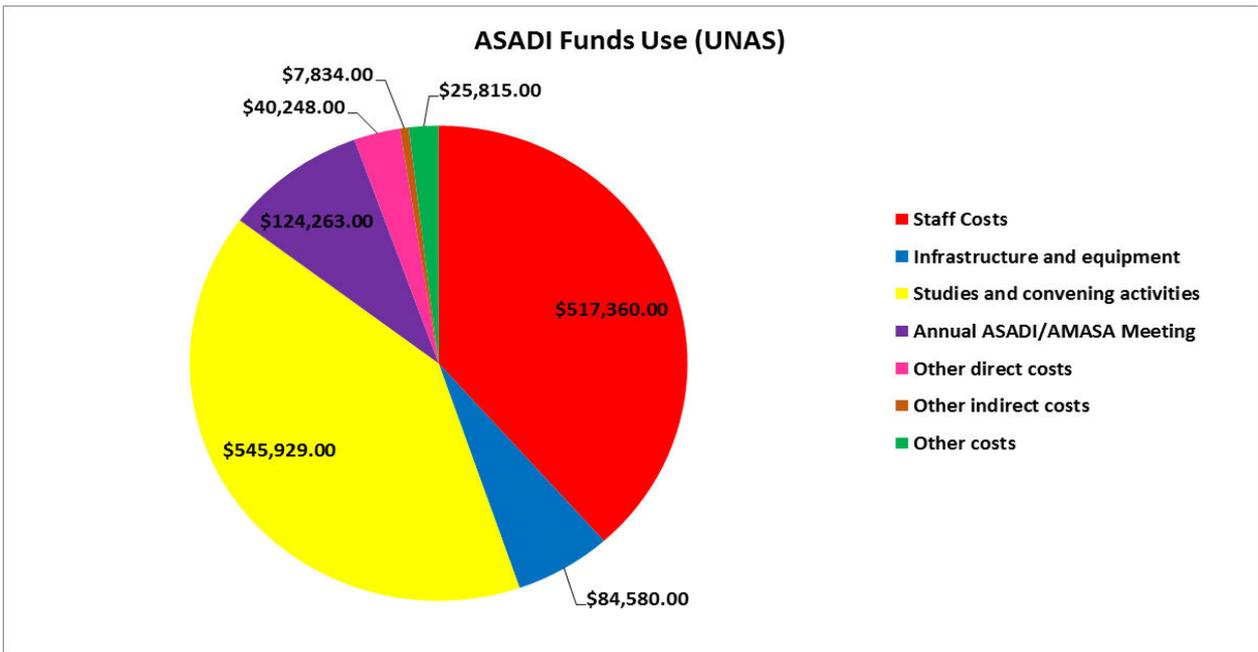
Source: EAS



Source: NAS



Source: ASSAf



Source: UNAS



## Appendix C

### The ASADI Review Data Catalogue

This catalogue lists material made available to the review panel from a range of sources, as well as material generated by the panel itself, and the dates this information was received.

#### I. Information Provided by USNAS Staff

##### A. Interactions with ASADI Board Members and Staff

The review panel interacted with the ASADI board and staff a number of times over the course of the review. For example, the chair and director of the ASADI board spent several hours with the review panel at its first meeting in London in January 2014. Other USNAS staff involved with ASADI joined that meeting by videoconference. The ASADI staff also held several teleconferences with review panel members and secretariat as they prepared for the site visits. The ASADI staff was always available to answer questions and provide information requested by the panel.

1. Dr Enriqueta C. Bond, Chair, ASADI Board and President Emeritus, Burroughs Wellcome Fund
2. Dr Patrick Kelley, Director, ASADI Board
3. Dr Lauren Alexander Augustine, ASADI Liaison to the Nigerian Academy of Science
4. Ms Patricia Cuff, ASADI Liaison to the Uganda National Academy of Sciences
5. Mr Jim Banihashemi, ASADI Financial Officer
6. Mr Christian Acemah, ASADI Director for Strategy and Program Development
7. Ms Angela Christian, ASADI Program Associate
8. Mr William Kearney, ASADI Director of Media Relations
9. Dr John Boright, Director of International Affairs, USNAS

##### B. General Information

Original 2003 ASADI proposal submitted by USNAS to Gates Foundation

The funded ASADI proposal

Annual reports to the Gates Foundation from 2005-2013

Updated register with key contact person for each of the ASADI academies

ASADI program midterm evaluation report

List of publications by each ASADI partner as collated by USNAS

ASADI/ AMASA conference learning collaborative agendas (2005-2012)

ASADI Board meeting agendas (2007-2012)

Academy governance training agendas

Academy staff training agendas

ASADI brochure 2008: progress and promise

Number of African scientists on IOM project committees- a chart

List of non-Gates Foundation donors of ASADI activities (2008-2012)

Updated list of representatives of Academies at the AMASA 9 meeting in Addis Ababa

Presentation to the ASADI Board on the program's achievements in 2013- presented at the Addis Ababa meeting

AMASA 10 plan of action- presentation by Prof Paul Mugambi at AMASA 9

Presentation of ASADI program to review committee in January 2014 at the London committee meeting

Nigeria, Cameroon, Uganda, Ethiopia and South Africa chronologies

**C. Link to ASADI information (general and training material) on the National Academies website ([http://www.nationalacademies.org/asadi/reference\\_materials.html](http://www.nationalacademies.org/asadi/reference_materials.html))**

This repository contains the following information:

1. Academy Purpose and Function
  - Overview of Science Academies
  - Overview of the Academy of Science of South Africa
  - Overview of the Kenya National Academy of Science
  - Overview of the Nigerian Academy of Science
  - Overview of the Uganda National Academy of Science
  - Overview of the United States National Academies
  - Group Activity Academy Overview
    - Science Academies Questions
    - Science Academies Answers
2. Strategic Considerations for Academies
  - Different Types of Academies
  - Implications of the Advisory Role for Science Academies
  - Perspectives from Service and Honorific Academies
    - A Perspective from a UK Academy
    - A Perspective from the Royal Society of Canada
    - A Perspective from the Institute of Medicine
  - Strategic Planning
    - KNAS Strategic Plan
    - EAS Strategic Plan
  - Financial Structure of Academies
  - Governance Structures of Academies
  - Role of Academy Staff
  - Role of Academy Members and Leadership
    - The Power of Partnership-Academy Members and Staff
    - Oversight Role of Council
  - Types of Academy Policies
  - Administration of Academies
  - Communication and Outreach Activities of Academies
3. Programmatic Activity for Academies with A Policy Advising Portfolio
  - Academy Staff Roles in Policy Advising Activities
    - Roles and Goals of Staff
  - Group Activity - Staff Roles
  - Generic Training for Staff
    - Financial Management
      - Academy Cost Management
      - Financial Management
    - Management Techniques
    - Research Tools
      - Reference Management Applications
      - Virtual Research Library
4. Project Initiation
  - Developing Statements of Tasks Proposals
  - Proposal Writing Fundraising
  - Group Activity

- Sample Statement of Task
- Malawi Case Study - Development of a work plan
- Composing Committees
  - Composing Managing Committees
  - Group Activity
    - BCOI Form
    - Sample CVs
    - CVs received
- Workshops and Convening Activities
  - Conducting Effective Workshops
  - Group Activity - Workshop Workplan
- Consensus Activities
  - Group Activity - Consensus Study Workplan
  - Report Review Process
  - Report Review at NRC
  - Sample Response to Review Memo
- Dissemination and Communication of Academy Products
  - BASAD - Communication and Products
  - Engaging the Media
  - Policymakers' booklets
  - Report Dissemination
- 5. Financial Administration of Academies
  - Proposal Writing Fundraising
  - Understanding the Terms of Your Agreement (Video)
- 6. Organizing Annual Meetings - Sharing Experiences
  - Experiences Sharing - ASADI Annual Meetings
- 7. ASADI Training material:
  - Leadership summit 2008
  - US training - 2007 program officers
  - Uganda program staff training - 2008
  - US program staff training - 2009

**D. ASADI financial expenditure information- project summary and expected project expenditure for the remainder of the program**

Nigeria

- Analysis chart of NAS expenses
- Year 1-7 budgets
- Annual meeting budget (2008)
- Annual workplans (2006-2012)

Cameroon

- 2011/2012 financial report
- Anti-malarial drug resistance budget
- Nutrition project budget
- Onchocerciasis control study budget

Uganda

- Analysis chart of UNAS expenses
- Year 1-10 budgets
- UNAS individual activities budgets

Ethiopia

- Annual meeting budget 2013

Grant 1-3 allocation budgets (50k, 50k and 100k)

Nutrition and agriculture budget

South Africa

Year 1-6 budgets

Annual meeting budget 2010

Funding sources report 2011

## **II. Information Provided by the ASADI Supported Academies**

A. AMASA 9 presentations from academies in Senegal, South Africa, Ethiopia, Cameroon, Uganda, Ghana, Kenya and Nigeria. The presentations focused on the following key areas:

The history and mission of your academy and its official status

The evolution in membership and governance

Relations with the national government

The position of your academy in the national policy advisory space (who else is involved with providing science advice?)

The physical, information management, financial management, and human resource status of your academy

The role of your academy as a convener and advisor

The recognition of your academy as an authoritative, independent voice that needs to be heard

The financial sustainability of your academy's policy advising role (what is your business model going forward?)

Uganda- Academy evolution table presented at Addis Ababa meeting for evaluators

B. Nigeria

Completed academy evolution table

Completed questionnaires 1 and 2

Site visit program with list of interviewees

List of publications

Sources of income raw data and graphs from commencement of ASADI program to 2013/2014

Raw data on how ASADI finances were spent by the Academy

C. Cameroon

Completed academy evolution table

Completed questionnaires 1 and 2

Site visit program with list of interviewees

List of publications

Sources of income raw data and graphs from commencement of ASADI program to 2013/2014

Raw data on how ASADI finances were spent by the Academy

D. Uganda

Completed academy evolution table

Completed questionnaires 1 and 2

Site visit program with list of interviewees

List of publications

Sources of income raw data and graphs from commencement of ASADI program to 2014

Raw data on how ASADI finances were spent by the Academy

E. Ethiopia

Completed academy evolution table

Completed questionnaires 1 and 2

Site visit program with list of interviewees

List of publications

Sources of income raw data and graphs from commencement of ASADI program to 2013/2014

Raw data on how ASADI finances were spent by the Academy

#### F. South Africa

Completed academy evolution table

Completed questionnaires 1 and 2

Site visit program with list of interviewees

List of publications

Sources of income raw data and graphs from commencement of ASADI program to 2013/2014

Raw data on how ASADI finances were spent by the Academy

#### G. Hard copy publications by all five academies

### III. Interviews Conducted, Briefings and Consultations

#### A. Academy Stakeholders

##### Nigeria

Nigerian Academy of Science Former and Current Council members

Nigerian Academy of Science Fellows

Nigerian Academy of Science secretariat management

Nigerian Academy of Science secretariat staff

Lagos State Ministry of Health

Federal Institute of Industrial Research

Federal Ministry of Health

Nigerian Universities Commission

Save the Children

Health Reform Foundation of Nigeria

Nigerian Young Academy

##### Cameroon

Cameroon Academy of Science Executive Committee

Cameroon Academy of Science Members

Cameroon Academy of Science secretariat management

Cameroon Academy of Science secretariat staff

L'Institut de Recherches Médicale et d'Etudes des Plantes Médicinales (IMPM)

Ministry of Public Health (MINSANTE)

The Fobang Foundation

Institute of Agricultural Research for Development (IRAD)

Ministère de l'Agriculture et du Développement Rural (MINADER)

Ministry of Scientific Research and Innovation (MINRESI)

Institute for Geological and Mining Research (IRGM)

##### Uganda

Uganda National Academy of Sciences Former and Current Executive Committee

Uganda National Academy of Sciences Fellows

Uganda National Academy of Sciences secretariat management

Uganda National Academy of Sciences secretariat staff

Ministry of Finance, Planning & Economic Development

Parliamentary Committee on Science and Technology

Ministry of Health

Ministry of Education and Sports

Uganda AIDS Commission

Uganda National Council of Science & Technology (UNCST)

##### Ethiopia

Ethiopian Academy of Sciences Board

Ethiopian Academy of Sciences Fellows  
Ethiopian Academy of Sciences secretariat management  
Ethiopian Academy of Sciences secretariat staff  
Ministry of Science and Technology  
Office of the Prime Minister  
Agricultural Transformation Agency (ATA)  
Addis Ababa University (AAU)  
Ministry of Agriculture  
Ethiopian Institute of Agricultural Research (EIAR)  
Addis Ababa University Youth Science Forum  
Ethiopian Biodiversity Institute  
MH Consult- an Engineering firm

#### South Africa

Academy of Science of South Africa Former and Current Council Members  
Academy of Science of South Africa Members  
Academy of Science of South Africa secretariat management  
Academy of Science of South Africa former and current secretariat staff  
Science journalist  
SANLAM, a private sector company  
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)  
Embassy of the Federal Republic of Germany in South Africa  
Embassy of the Republic of France in South Africa  
National Research Foundation  
South African Young Academy of Science  
Department of Science and Technology  
Department of Home Affairs

#### B. Non-Academy stakeholders

1. Dr Abdul Hakim Elwaer, Director of Human Resources, Science and Technology, African Union Commission
2. Professor Bruce Alberts- Former President, US National Academy of Sciences
3. Ms Jackie Olang, Executive Director, Network of African Science Academies
4. Dr Matt Hanson- The Gates Foundation
5. Dr Sally Stansfield- Former Gates Foundation staff
6. Professor Robin Crewe- Former President, Academy of Science of South Africa and Network of African Science Academies
7. Dr Barney Cohen- Former US National Academies staff
8. Professor Lamine Ndiaye- Former President, African Academy of Sciences
9. Professor Mohamed Hassan- Former President, African Academy of Sciences and NASAC, Co-chair IAP—The Global Network of Science Academies

#### **IV. Information Generated by the Review Panel**

Minutes of Panel meetings in Addis Ababa, London and Pretoria  
Proposal for the process (methodology) to be used for the evaluation  
Minutes of Panel teleconferences  
Nigeria, Cameroon, Uganda, Ethiopia, and South Africa site visit reports and summaries  
Questionnaires and interview schedules

## V. Information from Other Sources

- NASAC Stakeholder interview schedule- NASAC Dutch funding review  
NASAC Dutch funding end term evaluation report  
Article on science advocacy on SciDev.Net <http://www.scidev.net/global/journalism/feature/uk-s-science-media-centre-lambasted-for-pushing-corporate-science.html>  
Article on Academies' lobbying on SciDev.Net <http://www.scidev.net/global/communication/analysis-blog/africa-analysis-when-science-academies-should-lobby.html>  
Blogposts from ASADI VI meeting in South Africa  
<http://scidevnet.wordpress.com/category/africa-science-academy-conference-asadi-2010/page/2/>  
Nature editorial: Africa's academies: Robust scientific institutions won't be built in a day  
<http://www.nature.com/nature/journal/v450/n7171/full/450762a.html>  
Nature story: African academies show how science can save lives  
<http://www.nature.com/news/2009/091109/full/news.2009.1074.html>  
Example of a video by US National Academies presidents that has been shown at opening of annual conferences and disseminated online: <http://www.youtube.com/watch?v=Sa-3sOip3BQ>  
Article by Richard Mallet: Beyond Stuff: Capacity as a Relational Concept  
<http://blogs.worldbank.org/futuredevelopment/beyond-stuff-capacity-relational-concept>  
Guide to Evaluating Capacity Development Results: A collection of guidance notes to help development practitioners and evaluators assess capacity development efforts  
[https://wbi.worldbank.org/wbi/Data/wbi/wbicms/files/drupal-acquia/wbi/Guide%20to%20Evaluating%20Capacity%20Development%20Results\\_0.pdf](https://wbi.worldbank.org/wbi/Data/wbi/wbicms/files/drupal-acquia/wbi/Guide%20to%20Evaluating%20Capacity%20Development%20Results_0.pdf)  
Capacity Building in Africa: An OED Evaluation of World Bank Support  
<https://openknowledge.worldbank.org/handle/10986/7468>  
Inventing a Better Future: A Strategy for Building Worldwide Capacities in Science and Technology  
<http://www.interacademycouncil.net/File.aspx?id=27016>  
Knowledge, Networks and Nations: Global scientific collaboration in the 21st Century  
[https://royalsociety.org/~media/Royal\\_Society\\_Content/policy/publications/2011/4294976134.pdf](https://royalsociety.org/~media/Royal_Society_Content/policy/publications/2011/4294976134.pdf)  
World Social Science Report 2010: Knowledge Divides  
<http://unesdoc.unesco.org/images/0018/001883/188333e.pdf#page=120>



## Appendix D

### Publications from the ASADI-Supported Academies

#### **Cameroon Academy of Sciences (CAS)**

##### **ASADI/ AMASA Annual meeting report**

1. Prioritizing Food Security Policies for Health and Development in Africa: Science Academy–Policy Maker Interaction for Evidence-Based Decision Making (2006, Cameroon Academy of Sciences)

##### **Consensus Study Reports**

1. Recent Advances in Onchocerciasis Research and Implications for Control (2013, Cameroon Academy of Sciences)
2. Process Evaluation of the Public Health Nutritional Programs aimed at Combating Vitamin A Deficiency in Children aged between 0 and 60 Months in Cameroon: Phase 1: Evaluation of Vitamin A Supplementation Based programmes (2014, Cameroon Academy of Sciences) (Ongoing)

##### **Annual Reports/ Workplans/ Strategic Plans/ Memos**

1. Annual Reports (1995-2013)
2. Strategic Plan (2006-2010)

##### **Convening Activity Proceeding Reports/ Summaries/ Statements/ Policy Commentaries**

1. Conserving and Managing Biodiversity in Central Africa: Global Challenges and Local Solutions, (1999, Cameroon Academy of Sciences)
2. National Forum on Food Security: *Exploring Opportunities to Eliminate Food Insecurity in the Sudano-Sahelian Region of Cameroon*, (2008, Cameroon Academy of Sciences)
3. International Workshop on the African Genetic Diversity: *Reconstructing African-American Genetic Origins*, (2002, Cameroon Academy of Sciences)
4. National Workshop on Modern Biotechnology: *Genetically Modified Crops, Foods and Feeds - Cameroon Perspectives*, (2004, Cameroon Academy of Sciences)
5. International Seminar on Inquiry-Based Science Education in Francophone Africa, (2008, Cameroon Academy of Sciences)
6. Workshop on nutrition and health in Cameroon, (2010, Cameroon Academy of Sciences)
7. Workshop on tackling cardiovascular diseases/non communicable diseases in Cameroon, (2011, Cameroon Academy of Sciences)
8. Analytical Appraisal of the Report on “Health Professionals for a New Century: Transforming Education to Strengthen Health (2012, Cameroon Academy of Sciences)
9. Workshop on Drug Resistance to Anti-malaria Drugs in Cameroon, (2013, Cameroon Academy of Sciences)
10. National Workshop on “Pressures and Impacts of Climate Change on Health, Water resources and Agriculture in Cameroon: Considerations for Immediate and Future Adaptation Strategies, (2013, Cameroon Academy of Sciences)
11. International Workshop on Adaptation Strategies to Climate Change (agriculture & food security, water resources, health) (2013, Cameroon Academy of Sciences)
12. Preventing a Tobacco Epidemic in Africa: A call for effective action to support health, social and economic development (2014, Cameroon Academy of Sciences)

##### **Journals, Newsletters and General Publications**

1. Journal of the Cameroon Academy of Sciences, Volume 1 (1 and 2) 2001 – Volume 11 (2 and 3) 2013/December/2014/February, Cameroon Academy of Sciences

## **Ethiopian Academy of Science (EAS)**

### **ASADI/ AMASA Annual meeting report**

1. Report on the 9<sup>th</sup> annual Meeting of African Science Academies (AMASA-9); 10-12 November 2013 (2014, Ethiopian Academy of Sciences) – being finalized for printing
2. Declaration of the 9<sup>th</sup> Annual Meeting of African Science Academies (AMASA-9), 10-12 November 2013 (2013, Ethiopian Academy of Sciences)

### **Consensus Study Reports**

1. Report on Quality of Primary Education in Ethiopia: the Case of Selected Schools in Four Regional States (2014, Ethiopian Academy of Sciences) - in print
2. Report on Mapping the Health Research Landscape in Ethiopia (2013, Ethiopian Academy of Sciences)
3. Report on Integration of Nutrition into Agriculture and Health in Ethiopia (2013, Ethiopian Academy of Sciences)

### **Annual Reports/ Workplans/ Strategic Plans/ Memos**

1. Ethiopian Academy of Sciences: Resource Mobilization Strategy 2013-2017 (2013, Ethiopian Academy of Sciences)
2. Ethiopian Academy of Sciences: Strategic Plan 2011-2015 (2010, Ethiopian Academy of Sciences)

### **Convening Activity Proceeding Reports/ Summaries/ Statements/ Policy Commentaries**

1. Proceedings of the First Science Congress of EAS – “Science and Technology: Survival of a Nation”, Africa Hall, Addis Ababa, 15-16 December 2011(2014, Ethiopian Academy of Sciences) – ready for printing
2. ባዮቴክኖሎጂ፣ በኢትዮጵያ ሳይንስ አካዳሚ በተከታታይ ከተካሄዱ የሳይንስ ገለጻዎች ውይይቶች መድረክ የተወሰደ (2006፣ የኢትዮጵያ ሳይንስ አካዳሚ) – Biotechnology: Report on the Series of Public Lectures organized by the Ethiopian Academy of Sciences on Biotechnology in Amharic (2013, Ethiopian Academy of Sciences)
3. Policy Brief on Mapping the Health Research Landscape in Ethiopia (2013, Ethiopian Academy of Sciences)
4. Policy brief on Integration of Nutrition into Agriculture and Health in Ethiopia (2013, Ethiopian Academy of Sciences)
5. Proceedings of the Workshop on the State of Agricultural Science and Technology in Ethiopia; International Livestock Research Institute, Addis Ababa, Ethiopia; 28-30 November 2011 (2014, Ethiopian Academy of Sciences)
6. Proceedings of the Workshop on Challenges and Prospects of Engineering and Technology Education in Ethiopia; United Nations Conference Center (UNCC); 8 October 2011, Ethiopian academy of Sciences)
7. Proceedings of the Conference to Launch the Ethiopian Academy of Sciences; 10 April 2010; África Hall, UNECA (2010, Ethiopian Academy of Sciences)
8. Proceedings of the National Conference on the Establishment of the Ethiopian Academy of Sciences, United Nations Conference Centre (UNCC); February 13, 2009 (2010, the Ad-hoc Committee for the Establishment of the Ethiopian Academy of Sciences)

### **Journals, Newsletters and General Publications**

1. Academy of Sciences: History, Organizational Features, Activities & a Proposal for an Ethiopian Academy of Sciences (2008, the Ad-hoc Committee to Establish the Ethiopian Academy of Sciences)

## **Nigerian Academy of Science**

### **Annual Reports/ Workplans/ Strategic Plans/ Memos**

1. NAS Audited Financial Statements (2006-2010)
2. Annual Reports (2009-2013)

### **Convening Activity Proceeding Reports/ Summaries/ Statements/ Policy Commentaries**

1. Hospitals, Infections, and the Nigerian Environment – Professor Tolu Odugbemi, FAS, July 1999.

2. Technology and the Challenges of Oil and Gas Exploration in the Twenty-First Century – Professor K. Mosto Onuoha, FAS, January 2000
3. Mechanization of the Nigerian Agricultural Industry: Pertinent Notes, Pressing Issues, Pragmatic Options by Professor E. U. Odigboh, FAS, Abuja, April 2000
4. Environmental Degradation with Particular Reference to the sub-humid and Arid Parts of Nigeria: Prospects for Conservation by Professor Njidda Gadzama, FAS, Lagos, July 2000
5. Petroleum Refining, Automobile Emissions and Air Quality by Professor Alfred Susu, FAS, Yola, October 2000
6. Under-Developing Nigeria: The Conspiracy of Science and Society – Professor Oyewale Tomori, FAS, January 2002
7. Educating Nigeria for Competition and Development in the 21<sup>st</sup> Century – Professor Anya O. Anya, FAS, July 2002
8. Organisational Knowledge – Creation and Technological Innovation – Professor T.A.I. Akeju, FAS, October 2002
9. Renewable Energy Technologies for National Development: Resources, Status and Policy Directions – Professor A.S. Sambo, FAS, July 2003
10. Current Issues in Agricultural Biotechnology – Professor Efiom E. Ene-Obong, FAS, January 2003
11. The Role of Mathematical Sciences in the Scientific, Technological, Social and Economic Development in Nigeria by Professor Aderemi O. Kuku, FAS, January 2004
12. The Body Fluid is Not Only Water – Professor G.O. Olaniyan-Taylor, FAS, June 2004
13. Beyond Stochastics: Optimizing Fuzzy and Random Models for National Development – Professor O. Ibidapo-Obe, FAS, March 2006
14. From Plants to Medicines: Challenges and Prospects by Professor Charles Wambebe, FAS, May 2008
15. Beyond Curiosity: Science as a Panacea for Fast Tracked Sustainable National Development by Professor Olusegun Adewoye, FAS, May 2009
16. Environmentally Sustainable Energy Options for the Rural Sahelian Community Professor Njidda Gadzama, FAS, May 2010
17. Salt Intake and Hypertension – Professor Olusoga Sofola, FAS, January 2010
18. Nigeria’s Mineral Resources for Wealth, Industry, Infrastructure and Life, Professor Siyan Malomo, FAS, January 2011
19. The New Direction: A Reflection on Nigeria’s Electric Power Sector Development, Professor Bart O. Nnaji, FAS, May 2012
20. Disease Epidemic in Nigeria: Are We Helpless? – Professor C.O. Onyebuchi Chukwu, January 2013
21. Meteorology, Climate Change and the Nigerian Economy, Dr. Anthony C. Anuforom, May 2013.
22. Achieving an End to the AIDS Epidemic: Laying the Ground Work, Professor John A. Idoko, FAS, May 2014
23. Blood Safety in Nigeria November, 2006 Workshop Summary The Nigerian Academy of Science
24. Reducing Child Mortality in Nigeria: The Way Forward- July, 2007 Workshop Summary The Nigerian Academy of Science
25. Strengthening Health Systems in Nigeria November, 2007; Workshop Summary The Nigerian Academy of Science
26. Effective Primary Health Care Delivery in Nigeria-May, 2008. Workshop Summary, The Nigerian Academy of Science
27. Reducing Maternal and Infant Mortality in Nigeria: Bridging the Gap from Knowledge to Action- 23rd - 24th March, 2009
28. Integrated Disease Surveillance and Response: Bridging the gaps. October 2010, The Nigerian Academy of Science
29. Non Communicable Diseases: Preparedness, Prevention and Control of the rising burden in Nigeria February 2011. The Nigerian Academy of Science
30. Accreditation Report of the Research and Development Agencies of the Federal Ministry of Science and Technology – The Nigerian Academy of Science 2011
31. Training Manual on Getting Research into Policy and Practice- The PREVIEW Project. January 2012, The Nigerian Academy of Science
32. From the NAS-NASAC Joint Workshop: The Need and Niche for West/Central African Academies in National and Regional Development. (2010, Nigerian Academy of Science)
33. Science Reporting in Nigeria. (2011, Nigerian Academy of Science)
34. Effective ways of reporting Biotechnology and Agriculture in Nigeria. (2011, Nigerian Academy of Science)
35. The PREVIEW Project Report. January 2013; The Nigerian Academy of Science

36. Reducing Maternal and Perinatal Mortality in Nigeria: A needs Assessment study April 2012, The Nigerian Academy of Science
37. Education of Nigerian Health Professionals (Workshop Summary) December 2012, the Nigerian Academy of Science
38. Vaccine and Immunization Advisory Committee- First Meeting Report December 2012 The Nigerian Academy of Science
39. Integrated Disease Surveillance and Response: Stakeholders Awareness creation workshop 2013
40. Agriculture for Improved Nutrition of Women and Children in Nigeria: Advocacy Brief Number 1, February 2011
41. Agriculture for Improved Nutrition of Women and Children in Nigeria – Policy Considerations: Advocacy Brief Number 2: May 2011 Nigerian Academy of Science
42. Communiqué issued by The Nigerian Agriculture and Nutrition Stakeholders at the end of the First National Workshop on Agriculture for Improved Nutrition of Women and Children in Nigeria December 2010
43. Communiqué from the Vaccines Stakeholders Meeting: “*Immunization In Nigeria: Accountability, Attitude, Economics And Politics*” December 2013 NAS -VIAC, The Nigerian Academy Of Science
44. Communiqué issued at the end of The Preview Project Policy Retreat held at the AHI Residence Jibowu, Yaba, Lagos On June 8 - 9, 2011. Theme: Appraisal of the Lagos State Malaria Control Programme
45. Communiqué on the 2-Day Policy Retreat by Nigerian Academy of Science and Lagos State Ministry of Health on Non-Communicable Diseases (NCDs) held at the Solitude Inn Yaba Lagos from 8th-9th March 2012
46. Communiqué on the 2-Day Policy Retreat by Nigerian Academy of Science and Lagos State Ministry of Health on the Appraisal of the Lagos State Ministry of Health Immunization Programme Held at Action Health Incorporated, Yaba Lagos from 31st July -1st August, 2012
47. Communiqué on the Appraisal of the Community Based Health Insurance programme in Lagos State: Implication for Improved Health Care Delivery at The Nigerian Academy of Science (NAS) /LSMOH Preview Project Policy Retreat Held On 4-5 September 2012 at the AHI Residence, 14 Lawal Street, Jibowu Lagos
48. Communiqué of the Integrated Disease Surveillance And Response (IDSR) Stakeholder Awareness Creation Workshop Held On Tuesday 9th October 2012 at Abuja, Nigeria, the Nigerian Academy of Science

#### **Journals, Newsletters and General Publications**

1. NAS Newsletters (2008-2013)
2. Proceedings of the Nigerian Academy of Science: The official Journal of the Nigerian Academy of Science Vol. 6 Issue 1. 2013

#### **Academy of Science of South Africa (ASSAf)**

##### **ASADI/ AMASA Annual meeting report**

1. Turning Science On: Improving Access to Energy in Sub-Saharan Africa (ASSAf, 2010)

##### **Annual Reports/ Workplans/ Strategic Plans/ Memos**

1. ASSAf Annual Reports (2002-2013)
2. ASSAf Business Plans (2005-2011)
3. ASSAf Annual Performance Plans (2011-2014)
4. ASSAf Strategic Plans (2010 – 2014, 2011 – 2015, 2012 – 2016 and 2013 – 2017)
5. *South African Journal of Science* Business Strategy, ASSAf 2011
6. A Business Development Strategy for ASSAf, 2013
7. ASSAf Quarterly Reports to Department of Science and Technology (2011 onwards)
8. ASSAf Access to Information Manual in terms of the Promotion of Access to Information Act (ASSAf, 2014)

##### **Consensus Study Reports**

1. A Strategic Approach to Research Publishing in South Africa (ASSAf, 2006)
2. HIV/AIDS, TB, and Nutrition: Scientific Inquiry into the Nutritional Influences of Human Immunity with Special Reference to HIV infection and Active TB in South Africa (ASSAf, 2007)
3. Scholarly Books: Their Production, Use and Evaluation in South Africa Today (ASSAf, 2009)

4. Revitalising Clinical Research in South Africa: A Study on Clinical Research and Related Training in South Africa (ASSAf, 2009)
5. The PhD Study: An Evidence-based Study on How to Meet the Demands for High-Level Skills in an Emerging Economy (ASSAf, 2010)
6. Peer Review of Scholarly Journals in the Social Sciences and Related Fields (ASSAf, 2010)
7. Peer Review of Scholarly Journals in the Agricultural and Related Basic Life Sciences (ASSAf, 2010)
8. The State of Humanities in South Africa (ASSAf, 2011)
9. Towards a Low Carbon City: Focus on Durban (ASSAf, 2011)
10. Research and Impact of the Centres of Excellence (ASSAf, 2013)
11. Improved Nutritional Assessment of Micronutrients (ASSAf, 2013)
12. Grouped Peer Review of Scholarly Journals in Religion, Theology and Related Fields (RTRF) (ASSAf, 2013)
13. Grouped Peer Review of Scholarly Journals in the Health Sciences and Related Medical Journals (ASSAf, 2014)
14. Review of the State of the Science, Technology and Innovation System in South Africa (ASSAf, 2014)
15. The State of Energy Research in South Africa (ASSAf, 2014)
16. The State of Green Technologies in South Africa (ASSAf, 2014)

#### **Convening Activity Proceeding Reports/ Summaries/ Statements/ Policy Commentaries**

1. Evolving Science System in South Africa, Proceedings Report (ASSAf, 2001)
2. Promoting South African Science and Technology Capacities for the 21st Century, Proceedings Report (ASSAf, 2004)
3. Evidence-based Practice: Double Symposium Proceedings on Problems, Possibilities and Politics. (ASSAf, 2006)
4. IAP Water Programme: Regional Workshop for Africa. Proceedings Report (ASSAf, 2006)
5. IAP Water Programme: Regional Workshop for Africa. Proceedings Report (ASSAf, 2008)
6. Xenophobic Attacks, ASSAf Statement (ASSAf, 2008)
7. Teaching of Evolution in South African Schools, ASSAf Statement (ASSAf, 2008)
8. Science in Action: Saving the Lives of Africa's Mothers, Newborns and Children. Policymakers' Booklet (African science academies, 2008)
9. Durban Declaration TWAS conference, ASSAf Statement (ASSAf, 2009)
10. Local Economic Development in Small Towns, Housing Delivery, and the Impact on the Environment. Workshop Report (ASSAf, 2009)
11. Science-Based Improvements of Rural/Subsistence Agriculture. Proceedings Report. (ASSAf, 2009)
12. Critical Issues in School Mathematics and Science; Pathways to Progress. Symposium Proceedings Report (ASSAf, 2009)
13. The State of Science in South Africa. Book. (ASSAf, 2009)
14. Inquiry-Based Science Education: Increasing Participation of Girls in Science in sub-Saharan Africa, Policymakers' Booklet (ASSAf, 2010)
15. GMOs for African Agriculture: Challenges and Opportunities. Workshop Proceedings Report: (ASSAf, 2010)
16. Preparing for the Future of HIV/AIDS in Africa: A Shared Responsibility (IOM and ASSAf, 2011)
17. The Emerging Threat of Drug-Resistant Tuberculosis in Southern Africa: Global and Local Challenges and Solutions. Summary of a Joint Workshop (IOM and ASSAf, 2011)
18. Nuclear Energy Safety, ASSAf Statement (ASSAf, 2012)
19. Nuclear Energy Safety, Symposium Proceedings Report (ASSAf, 2012)
20. Commentary on the Integrated Resource Plan for Electricity 2010-2030 (ASSAf, 2012)
21. Commentary on the Department of Higher Education and Training Green Paper for Post-school Education and Training (ASSAf, 2012)
22. Science, Water and Sanitation. A Policymakers' Booklet (ASSAf, 2012)
23. Regulation of Agricultural GM Technology in Africa - Mobilising Science and Science Academies for Policymaking. Policymakers' Booklet (ASSAf, 2012)
24. Commentary on the Draft Regulations for the Establishment of a National Institute for the Humanities and Social Sciences (NIHSS) (ASSAf, 2013)
25. Technological Innovations for a Low Carbon Society, Conference Proceedings Report (ASSAf, 2013)
26. Green Technologies: Drivers, Barriers and Gatekeepers, Symposium Proceedings Report (ASSAf, 2014)
27. Changing Patterns of Non-Communicable Diseases, InterAcademy Medical Panel Conference Proceedings Report (ASSAf, 2014)
28. Preventing a Tobacco Epidemic in Africa: A Call for Effective Action to Support Health, Social and Economic Development, Policymakers' Booklet (African science academies, 2014)

### **Journals, Newsletters and General publications**

1. ASSAf Science for Society Newsletters (2006-2011)
2. Electronic ASSAf Science for Society Newsletters (2011-2014)
3. Editors' Terms of Reference (ASSAf, 2008)
4. Editors' National Code of Best Practice (ASSAf, 2008)
5. ASSAf Concises (2010, 2012)
6. SciELO Brochure (ASSAf, 2010)
7. *South African Journal of Science*, 6 issues published each year since 1905. Taken over by ASSAf in 2002
8. *Quest, Science for South Africa*, 4 issues published each year since 2004. Established by ASSAf.

### **Uganda National Academy of Science (UNAS)**

#### **Annual Reports/ Workplans/ Strategic Plans/ Memos**

1. African Science Academy Development Initiative Annual Narrative Progress Reports (2005 –2008)
2. M&E plan. 2005, 2006, 2007, 2008 (Uganda National Academy of Sciences)
3. Strategic Plan (2006 – 2011, National Academy of Sciences)
4. Report dissemination plan (2008, Uganda National Academy of Sciences)

#### **Consensus Study Reports**

1. Mosquito Alert: Approaches to Assessing and Managing Malaria Vector Resistance to Insecticides Used for Indoor Residual Spraying in Uganda—A Contribution to a National Indoor Residual Spraying Strategy (2008, Uganda National Academy of Sciences)
2. Feasibility of Regulating Herbal Formulations and Other Forms of Alternative Medicinal Therapies Sold on the Ugandan Market: A Position Paper (2009, Uganda National Academy of Sciences)
3. The Scope of Biosafety and Biosecurity in Uganda: Policy Recommendations for the Control of Associated Risk (2010, Uganda National Academy of Sciences)
4. Preparing for the future of HIV/AIDS in Africa: A shared Responsibility: A Long-Term Strategy for HIV/AIDS in Uganda: A Call to Action (2011, Uganda National Academy of Sciences)

#### **Convening Activity Proceeding Reports/ Summaries/ Statements/ Policy Commentaries**

1. 5th proceedings of UNAS conference and annual general meeting. Theme: bio-technology for development in Uganda." (October 2005, Uganda National Academy of Sciences)
2. Uganda National Academy of Sciences, "Proceedings of Uganda National Academy of Sciences: Sciences Education Workshop." (October 2005, Uganda National Academy of Sciences)
3. Uganda National Academy of Sciences, "Proceedings of the sixth annual conference and general meeting of the UNAS. Science and Technology for improving productivity and food security in Uganda." (October 2006, Uganda National Academy of Sciences)
4. Partnering for Science in Uganda: Establishing the Forum on Health and Nutrition (2006, Uganda National Academy of Sciences)
5. Malaria Control and Prevention: Strategies and Policy Issues (2007, Uganda National Academy of Sciences)
6. Impact of Climate Change to National Development Processes. Proceedings of Annual General Conference; 30pp; ISSN: 1819-7078 (2007, Uganda National Academy of Sciences)
7. Uganda National Academy of Sciences, "Proceedings of Uganda National Academy of Sciences: International conference of the network of academies of science on Islamic countries." Theme: Science, technology, innovations, and development." (12 – 13 December 2007, Uganda National Academy of Sciences)
8. Uganda National Academy of Sciences, "Proceedings of Uganda National Academy of Sciences: Annual scientific conference. Theme: Impact of climate change to national development processes. (2007, Uganda National Academy of Sciences)
9. Promoting Biosafety and Biosecurity within the Life Sciences: An International Workshop in East Africa (2008, Uganda National Academy of Sciences)
10. Status of Food and Nutritional Security in Uganda. Proceedings of Annual General Conference (In Press); ISSN: 1819-7078 (2008, Uganda National Academy of Sciences)

11. Good Practice in Science and Technical Education (Workshop Proceedings In Press) (2008, Uganda National Academy of Sciences)
12. Uganda National Academy of Sciences, "Malaria Mosquito Alert: Approach to assessing and managing malaria vector resistance to insecticides used for IRS in Uganda –Contributing to a National IRS Strategy." (2008, Uganda National Academy of Sciences)
13. Good Laboratory Practice (Workshop Proceedings for Review and Final Editing) (2009, Uganda National Academy of Sciences)
14. Establishing and Promoting Good Laboratory Practice and Standards for Running Safe, Secure and Sustainable Laboratories in Sub-Saharan Africa (2009, Uganda National Academy of Sciences)
15. A Decision-Making Framework for Malaria Vaccine: Planning for a National Decision on Malaria Vaccine (2010, Uganda National Academy of Sciences)
16. Quality of Care for Mental Health and Neurological Disorders Workshop (2010, Uganda National Academy of Sciences)
17. Improving Nutrition Through Agriculture in Nigeria and Uganda: Needs, Opportunities, Requirements and Strategies for the Future (2011, Uganda National Academy of Sciences)
18. Mainstreaming Nutrition with Agriculture in Uganda: Role of Agriculture in Improving the Nutritional Status of Women and Children (2011, Uganda National Academy of Sciences)
19. The Advisory Committee on Vaccines and Immunization: Improving Vaccine and Immunization Coverage in Uganda. (2012, Uganda National Academy of Sciences)
20. Policy Advising in Uganda: Establishing the Advisory Committee on Vaccines and Immunization. (2012, Uganda National Academy of Sciences)
21. Uganda National Academy of Sciences, Partnering for Science in Uganda: Establishing the forum on health and nutrition." Uganda National Academy of Sciences. (No date, Uganda National Academy of Sciences)
22. Science in Action: Saving the Lives of Africa's Mothers, Newborns and Children (2009, Cameroon Academy of Sciences, Ghana Academy of Arts and Sciences, Kenya National Academy of Sciences, Nigerian Academy of Science, Académie des Sciences et Techniques du Sénégal, Academy of Science of South Africa , and Uganda National Academy of Sciences)
23. Informing Strategies Improving Results: The Role of Civil Society Organizations in Managing for Results in Africa's Health Sector (2011, Uganda National Academy of Sciences)
24. Enhancing Awareness of the benefits of Biotechnology and GMO for National Development (2013,Uganda National Academy of Sciences)
25. Making Science Information more accessible.A Science Communication Training Workshop Summary Report (2012,Uganda National Academy of Sciences)
26. Report of Proceedings at The Launch of TWAS Uganda Chapter Young Scientists Forum (2011,Uganda National Academy of Sciences)
27. Integrating Nutrition and Agriculture: Use of Extension Workers and Community Models in Uganda (2011,Uganda National Academy of Sciences)
28. The Role of Science Academies in Generating Evidence-Based Advice for Effective Policy Decision Making: The case of Climate Change (2010,Uganda National Academy of Sciences)
29. Nutritionalisation of Agriculture in Uganda-Role of Agriculture in improving the Nutritional status of women and children (2010.Uganda National Academy of Sciences)
30. Policy recommendations for the proposed secondary Education curriculum Reform in Uganda. (2010,Uganda National Academy of Sciences)
31. Policy Recommendations for improving the Teaching and Learning of Science in Uganda. (2010,Uganda National Academy of Sciences)

#### **Journals, Newsletters and General Publications**

1. UNAS Newsletters (2005-2013)
2. Radio Uganda, invitation for talk radio. (November 2005, Uganda National Academy of Sciences)
3. Biotechnology in Development. Proceedings of Annual General Conference. ISSN: 1819 – 7078 (2005, Uganda National Academy of Sciences)
4. Sunday Vision, "Don hails state science policy." (December 2005, Uganda National Academy of Sciences)
5. News Vision, "UNAS gets sh5b for research." (May 2005, Uganda National Academy of Sciences)
6. Best Practices in Science Education in Africa. Proceedings of Uganda National Academy of Sciences (2005), 64pp; ISSN: 1819 – 7078 (2005, Uganda National Academy of Sciences)
7. The New Vision, letter inviting participation. (June 2006, Uganda National Academy of Sciences)

8. Centre for Development Communication, request for partnership. (August 2006, Uganda National Academy of Sciences)
9. Science and Technology Strategies for Improving Agricultural Productivity and Food security in Uganda. Proceedings of Annual General Conference. ISSN: 1819 –7078 (2006, Uganda National Academy of Sciences)
10. Partnering for science in Uganda: Establishing the Forum on Health and Nutrition (2006, Uganda National Academy of Sciences)
11. Malaria Control and Prevention: Strategies and Policy Issues, 173pp; ISSN1819-7086 (2006, Uganda National Academy of Sciences)
12. Mosquito Alert: Approaches to Assessing and Managing Malaria vector Resistance to Insecticides Used for Indoor Residual Spraying in Uganda – A Contribution to a National Indoor Residual Spraying Strategy, 136pp; ISBN 9970 86603 9, (2006, Uganda National Academy of Sciences)
13. New Vision, “US to fund DDT spraying envoy.” (September 2006, Uganda National Academy of Sciences)
14. New Vision, “Bukenya advocates for innovative agriculture.” (October 2006, Uganda National Academy of Sciences)
15. New Vision, “Experts discuss malaria.” (October 2006, Uganda National Academy of Sciences)
16. New Vision. Article on UNAS first publication. (March 2007, Uganda National Academy of Sciences)
17. The Monitor, article on Ugandan scientists, (December 2007, Uganda National Academy of Sciences)
18. National Monitor, “Low motivation of scientists,” (December 2007, Uganda National Academy of Sciences)
19. New Vision, “Uganda hosts symposium for Network of Academies of Sciences in Islamic Countries.” (December 2007, Uganda National Academy of Sciences)
20. Uganda National Academy of Sciences, “Malaria Control and Prevention: Strategies and policy issues.” (2007, Uganda National Academy of Sciences)
21. AFM, article on Uganda’s mosquito spraying efforts, (February 2008, Uganda National Academy of Sciences)
22. New Vision. Article on academy event. (March 2008, Uganda National Academy of Sciences)
23. UNAS, report launch, (June 2008, Uganda National Academy of Sciences)
24. Science and Development Network, Uganda Pilots scientist-MP Shadowing Scheme. (July 2008, Uganda National Academy of Sciences)
25. African Science News Service, report on Ugandan Academy, (July 2008, Uganda National Academy of Sciences)
26. The New Vision, “Scientists call for more studies on DDT”. (July 2008, Uganda National Academy of Sciences)
27. Human Resources Management Policy, (July 2008, Uganda National Academy of Sciences)
28. Daily Monitor, announcing science week. (August 2008, Uganda National Academy of Sciences)
29. New Vision, “DDT might fail”, scientists warn. (September 2008, Uganda National Academy of Sciences)
30. USJA, invitation to attend conference. (October 2008, Uganda National Academy of Sciences)
31. Feature, The return of Neglected Crops. (November 2008, Uganda National Academy of Sciences)
32. Ultimate Media, Science Academy Calls for Charter. (November 2008, Uganda National Academy of Sciences)
33. Promoting Biosafety and Biosecurity Within the Life Sciences: An International Workshop, 197; ISSN 1819-7086 (2008, Uganda National Academy of Sciences)
34. The Uganda HIV/AIDS Partnership. “Research, Academia, and Science. Self-coordinating entity of the Uganda AIDS partnership.” Issue 1: (2008, Uganda National Academy of Sciences)
35. Policy Brief – Roundtable Declaration on Sustainable Utilization of Energy and biodiversity Resources for Wealth Creation and development (2012), Uganda National Academy of Sciences)
36. Policy Brief – Statement on Climate Change. (2010, Uganda National Academy of Sciences)

## Appendix E Acronyms

This list excludes national-level bodies mentioned only in the Country Profiles which form part of section 2.

AAS: African Academy of Sciences  
ACVI: Advisory Committee on Vaccines and Immunisation (Uganda)  
AMASA: Annual Meeting of African Science Academies  
ASADI: The African Science Academy Development Initiative  
ASSAf: Academy of Science of South Africa  
AU: African Union  
AUC: African Union Commission (the AU secretariat)  
CAS: Cameroon Academy of Sciences  
CSIR: Council for Scientific and Industrial Research (South Africa)  
EAS: Ethiopian Academy of Sciences  
IAC: InterAcademy Council (an advisory body to international organizations)  
IAMP: Interacademy Medical Panel (of medical academies and medical arms of general academies)  
IAP: IAP—The Global Network of Science Academies  
ICSU: The International Council for Science  
KNAW: Royal Netherlands Academy of Arts and Sciences  
MINESUP: The Ministry of Higher Education (Cameroon)  
MINRESI: Ministry of Scientific Research and Innovation (Cameroon)  
NAS: Nigerian Academy of Science (see also US NAS)  
NASAC: Network of African Science Academies  
NEPAD: The New Partnership for Africa's Development  
PREVIEW: Policy Research Evidence for Effective Working of the Nigerian Health Systems initiative  
SWOT Analysis: Analysis of some organization in terms of Strengths, Weaknesses, Opportunities and Threats  
UNAS: Uganda National Academy of Sciences  
UNICEF: The United Nations Children's Fund (UN organization working in the interests of children)  
USAID: The U.S. Agency for International Development, the U.S. federal body for development aid  
USNAS: National Academy of Sciences (US) (so-called here to distinguish it from the Nigerian academy)



## Appendix F The ASADI Timeline

2003	May: Proposal Submitted
2004	<p>March: Develop criteria for selection of members on Board on African Science Academy Development (BASAD)</p> <p>April: Press Release announcing program</p> <p>April – May: 10 Board members nominated and approved</p> <p>May: Seven African Science Academies contacted for potential intense partnership (8 including the regional African Academy of Sciences),</p> <p>June: First Board of ASADI (BASAD) meeting</p> <p>Summer/Fall: Board members visit each of the national and regional academies to determine intense partnership countries</p> <p>November: Select Program Partners at BASAD Meeting</p>
2005	<p>January: Inform Academies chosen for intense partnerships</p> <p>February – March: Board staff visit the intense partnership science academies of Nigeria, South Africa, and Uganda</p> <p>March: Planning session for first annual meeting in Nairobi, Kenya</p> <p>March: Academy Fellowship Program implemented</p> <p>March: Joint Study Implementation and Ongoing Training</p> <p>October: Senior Staff Training Session (invited representatives from primary partners to attend IOM’s Forum on Microbial Threats and to discuss evidence-based policy advice in the African context)</p> <p>November: Annual Conference: Nairobi, Kenya; focus: Achieving the Millennium Development Goals</p> <p>November: Stakeholder meetings to increase visibility of the academies</p>
2006	<p>February: Stakeholder meetings to increase visibility of the academies</p> <p>February: InterAcademy Advisory Panel (IAAP) developed to engage input and participation by all academies in Douala, Cameroon</p> <p>February: Planning Meeting with leadership of Cameroon Academy of sciences for annual conference</p>

	<p>February: Royal Dutch Academy hosted a capacity building event for African science academies</p> <p>February – March: USNAS staff facilitated strategic planning sessions with the academies of Uganda, Kenya, Nigeria, Cameroon, Ghana, South Africa, and the African Academy of Sciences</p> <p>March: UK Royal Society hosted a capacity building event for African science academies</p> <p>November: Annual Conference: Yaounde, Cameroon; focus: Food Security</p> <p>November: ASSAf Symposium on Evidence-Based Practices</p> <p>Additional, non-ASADI sponsors for projects this year: Rockefeller Foundation</p>
2007	<p>March: Program Officer Training, Washington DC</p> <p>May: Media Workshop</p> <p>May: ASADI Forum on Evidence-Based Health Policy</p> <p>September: Program Financial Staff Retreat, Kenya</p> <p>November: Annual Conference: Dakar, Senegal; focus: Water and Health</p> <p>Additional, non-ASADI sponsors for projects this year: World Bank and US Department of State</p>
2008	<p>March: African Science Academy staff training, Uganda</p> <p>April: Leadership Summit (Governance Training) for Council Members, Washington, D.C.</p> <p>September: Program Financial Staff Retreat, South Africa</p> <p>November: Learning collaborative session for members and staff of African Academies</p> <p>November: Annual Conference: London, UK; focus: Sponsor Mobilization</p> <p>Additional, non-ASADI sponsors for projects this year: Royal Society UK; UK's Parliamentary Office of Science and Technology (POST); Dutch Ministry of Foreign Affairs; and Alfred P. Sloan Foundation</p>
2009	<p>Mid-Term Review</p> <p>September: Program Officer Training, Washington, DC</p> <p>November: Annual Conference: Accra, Ghana; focus: Maternal, Newborn, and Child Health in Africa – Address given by Kofi Annan</p>

	<p>Additional, non-ASADI sponsors for projects this year: Johns Hopkins Bloomberg School of Public Health; MARS; UNICEF; Save the Children</p>
2010	<p>November: Annual Conference: Cape Town, South Africa; focus: Access to Energy</p> <p>Additional, non-ASADI sponsors for projects this year: Pfizer Global Pharmaceuticals; United States Department of State; World Health Organization; Center for Disease Control and Prevention; Gates Foundation (separate from ASADI Grant funds)</p>
2011	<p>January: Ethiopia and Cameroon elevated to intense partnerships</p> <p>February: Academy of Science for South Africa (ASSAf) “graduates” from the ASADI program</p> <p>November: Annual Conference: Kampala, Uganda; focus: Aid Effectiveness</p> <p>November: Online international database of leading African scientists pilot launched</p> <p>Additional, non-ASADI sponsors for projects this year: Rockefeller Foundation; PATH MVI; Gates Foundation (separate from ASADI grants); UNAIDS, GAVI; the African Development Bank; IrishAID; and the Uganda AIDS Commission; Shuttleworth Foundation; the Oppenheimer Memorial Trust; the InterAcademy Panel (IAP) and the Network of African Science Academies (NASAC); and the Dutch Ministry of Foreign Affairs through NASAC</p>
2012	<p>ASSAf assumes role of regional mentor, advisor, and partner for emerging academies of science in the SADC region (Zimbabwe, Mozambique, Mauritius, and Zambia) through establishment of SASADI (the Southern African Science Academy Development Initiative)</p> <p>November: Annual Conference: Lagos, Nigeria; focus: Climate Change</p> <p>Additional, non-ASADI sponsors for projects this year: Rockefeller Foundation, Ecobank Bank</p>
2013	<p>February: Nigerian Academy of Science “graduates” from ASADI</p> <p>November: Annual Conference: Addis Ababa, Ethiopia; focus: Biotechnology for Africa’s Development</p>
2014	<p>August: Africa Summit: Symposium on Science, Technology, and Innovation for Africa, Washington DC</p> <p>November: Annual Conference: Kampala, Uganda; focus: Country Ownership of the Post-2015 Sustainable Development Goals</p>



## Appendix G Statement of Task

### Final Evaluation of:

#### *Enabling African Scientific Communities to Provide Policy Advice in the Public Interest: An Eleven Year Program of Science Academy Capacity Building*

#### **Background:**

In 2004 the US National Academy of Sciences was awarded a ten-year, \$20 million grant by the Bill and Melinda Gates Foundation to strengthen African science academies so that they could assume a more prominent role as independent national advisers on matters of science and health. The award had the following seven formal objectives:

- Develop partnerships with African academies of science;
- Train approximately 30 African academy staff members to conduct policy advisory studies and manage finances;
- 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;
- Complete at least 18 policy advisory activities in areas impacting African health and sustainable development;
- Provide upgrades to the human and material infrastructure of participating science academies;
- Develop an alliance of African science academies through nine annual regional symposia and collaborative workshops; and
- Complete interim and final evaluation reports, which will summarize lessons learned and make recommendations for future capacity building activities.

This effort has become known as the African Science Academy Development Initiative (ASADI). ASADI is now an 11-year effort originally focused on building the advisory capacities of eight African academies of science including those in Cameroon, Ghana, Kenya, Nigeria, Senegal, Uganda, and South Africa, as well as the regional African Academy of Sciences. In year 1 the ASADI Board, after site visits to all eight academies and a review of submitted documentation, decided that the program should focus on capacity-building at three specific national academies. Reflecting their pre-existing state of development and the availability of national funds for sustainable support, a development effort of 6 years, 8 years, and 9 years respectively was envisioned for the academies in South Africa, Nigeria, and Uganda. In the first five years, the grant also provided modest support to the academies of Kenya, Cameroon, Senegal, and Ghana for strategic planning efforts and to host in rotation the annual meeting for the entire ASADI initiative. In 2011, the new Ethiopian Academy of Science was selected as a ninth partner.

The ASADI vision has been to develop African science academies so that they are regarded the preferred source of trusted, authoritative, apolitical, “home-grown” consensus scientific advice in each nation. In line with the program objectives and grant timeline, the Academy of Science of South Africa

“graduated” from the ASADI program in February 2011 and the Nigerian Academy of Science “graduated” at the end of February 2013, both having achieved financial independence and other programmatic milestones.

In 2011 the project was given a one-year no cost extension until 2015 in order to more optimally expend available resources. This facilitated additional support to the academies in Ethiopia and Cameroon which became intense development partners that year.

The attached 2013 annual report to the Gates Foundation reflects further detail on the state of the project.

The final objective of the project is to obtain an independent, external evaluation to summarize lessons learned and to make recommendations for future capacity-building activities of this nature.

## **Statement of Task**

The US National Academy of Sciences (USNAS) requests the InterAcademy Council to provide a rigorous final evaluation of the ASADI initiative for a sum not to exceed \$250,000. The evaluation effort would be initiated by 1 October 2013 and be delivered at AMASA 10, the final annual meeting of the ASADI program which will take place in Uganda between November and December 2014.

The evaluator will conduct a summative evaluation of the program against the objectives and milestones established in the ASADI grant and annual reports. The evaluation will employ quantitative and qualitative approaches. The evaluation will focus on the output and outcomes of investments in the three original “intense” partners (Uganda, Nigeria, and South Africa) as well as the academies in Cameroon and Ethiopia which started to receive substantial investments in 2011. The evaluation should also assess the impact of the annual meetings as a vehicle for achieving the goals of the program. Lessons learned from the perspectives of the US NAS and its African partners concerning the capacity-building processes employed should also be captured.

The evaluation will employ a consensus committee process involving four to five individuals with substantial expertise in the provision by academies of independent, evidence-based advice; the African scientific-political context; the evaluation of development programs; the governance of science academies; and the administrative and financial management of small non-profit organizations in Africa. The composition of the committee will include representation from more developed regions of the world as well as Sub-Saharan Africa. Candidates will be assessed for potential conflicts of interest and substantial biases. It is expected that the process will be supported by competent staff, ideally familiar with science academies and their role.

The consensus committee mechanism will gather data through means including review of annual reports to the Gates Foundation and other historic documents, partner African academy publications produced during the period of the grant, a day of African academy orientation and initial data gathering at ASADI 9 (known publicly as AMASA 9, which is scheduled for Addis Ababa, Ethiopia 10-between 10 and 14 November 2013), a structure survey completed by the African academies, and two-person (committee member and/or staff) three day site visits to the US NAS and the five African primary partners for interviews with academicians, staff, national government officials, and other external stakeholders.

The site visits will assess outputs, outcomes, and impacts of overall academy operations, individual reports, document lessons learned concerning the capacity-building process, and capture relevant insights regarding the methods employed by the ASADI program, sustainability, and future initiatives to maintain and expand built capacity.

## Appendix H

### SWOT Analysis of the ASADI Process

At a Washington summit meeting in August 2014, ASADI participants were asked to carry out a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the ASADI experience. Respondents included both the intense ASADI partner academies as well as those that received more limited support. These are their responses, lightly edited for clarity

#### Strengths

The annual meeting  
Evidence-based policy discussion  
Its governance  
Wide variety of approaches adopted  
Access to expertise  
Links to funders  
Support to secretariat  
Helping with credibility  
Door to collaboration  
Technical report writing  
Shared responsibility to the community  
Workshops  
Links to young people  
Strengthening membership and visibility  
Studies carried out  
Confidence-building workshops and meetings  
Valuable experience  
Potential role for NASAC if ASADI reports, lessons and network potential can be used to develop and connect with young academies globally and with the senior academies of the ASADI network  
Supporting young academies  
Enabling and empowering  
Training members and staff  
Linking with other academies  
Focus on the purpose of the Academy  
Appropriate and timely  
Bottom-up  
Availability of publications  
ASADI has helped academy transformation from honorific to advisory

#### Weaknesses

Stratification into partnerships of different strengths  
HR capacity development  
Physical infrastructure development  
Funding  
Lack of coordinated mechanism for partnership with African academies  
Bias to health  
Not enough African academies benefited directly  
Not enough support for equipment, training etc  
Absence of strategy for sustainability of ASADI  
Little partnership in problem solving  
Measures of success not clear  
No clear, innovative means of public engagement  
Not enough staff for implementing projects

Not enough interactions between projects  
Reports and outputs were not disseminated to all NASAC members  
Many issues still not addressed eg energy, climate, poverty  
Too much control of ASADI-organized meetings – “This is how we do it, so be it”  
Reports only in English  
Short-lived

### Opportunities

Develop demand for evidence based policy  
More partnerships  
Economic growth in Africa  
Relevance and influence to Africa  
Global diplomacy  
Experience sharing  
Appointment to boards in Africa and USA  
Grow understanding of African problems  
Consolidating and extending partnerships  
Diversifying work  
Better focused studies  
Solving serious basic problems by sharing study findings  
Being emulated  
Catalyse development  
Institutional support  
Supporting young academies  
Greater and more diversified impact  
Wider reach globally  
The world is one  
Access to more global intelligence  
Better relations with US as a nation

### Threats

Sustainability of partnerships  
Human capacity turnover  
Political stability  
Lack of recognition in own country  
Resources  
Legal establishment for academies  
Lobbyists  
Quality control in report reviewing  
Corruption  
Conflicts  
Lack of balance of language and geography (N and W Africa)  
Lack of political, financial and institutional support  
Losing US NAS as partner  
Apathy from members  
Lack of internal African coordination between Academies  
Isolation  
Threats to liberty and suppression of freedom of speech and democracy  
Rivalry within academies  
Lack of any, or strong, strategic plan

Appendix I  
Academy Evolution Tables: How ASADI Helped the Academies to Develop Through Time

<b>Academy Evolution Tables</b>									
<b>Cameroon Academy of Sciences</b>									
Data category	Status/ situation before ASADI	Current status in 2014 highlighting main lines of development	Nature of ASADI support with regard to this development e.g. financial, in-kind support, advice provided	Overall importance of ASADI's contribution on this development (Please rate on a scale of 1-5 where 1=very low, 2=low, 3=neutral, 4=high and 5= very high)	Key drivers of change underlying this development e.g. need to diversify membership, potential impact on fundraising activities if change was achieved	Key challenges experienced in implementing this development	Related outputs and dates of publication/ delivery e.g. a strategic plan, annual reports, financial audit reports	Additional Comments	
<b>Aspects of Academy Development</b>									
<b>Legal status of Academy e.g. Act of Parliament, not-for-profit</b>	Formally recognized (Reg. No. 00701/RDA/JOG/BAPP ) on 29 May 1991 by the Cameroon Government in accordance with law No. 90/053 of 19 Dec. 1990, regulating freedom of association	To strengthen it, a draft decree is pending signature at the Presidency of the Republic	Sensitization of stronger links with government	4	Potential impact on funding	Getting public officials to understand the role of a science academy in society	None		
<b>Strategic planning i.e articulation of vision, mission, objectives, and thematic priorities</b>	None	A strategic plan highlighting the vision, mission, core values and the goals of CAS is available.	Financed by ASADI	5	Need to promote the use of science, technology and innovation for the economic, social and cultural development of Cameroon.	Getting finances to implement the strategic plan.	A strategic plan document, 2004	Needs updating	

<p><b>Membership including numbers, election, involvement in Academy activities etc</b></p>	<p>67</p>	<p>88 (79 men and 9 women) who are divided into the colleges of Biological Sciences (39), Mathematical and Physical Sciences (25), Social Sciences (22) and Honorary Fellow (1).</p>	<p>Activities financed by ASADI have given CAS more visibility which has led to an increased demand for membership.</p>	<p>5</p>	<p>1. Need to diversify membership. 2. Increased visibility of CAS. 3. Potential impact on fun raisings</p>	<p>Need for highly qualified membership that can be independent and able to apply the rigorous procedures for objective and unbiased analysis that can enable CAS to deliver credible advice.</p>	<p>Fellows list with year of induction</p>
<p><b>Academy leadership i.e. Executive Committee, Council and Governing Board. Information should consider meetings, Constitution, election, Council structure, strategic planning sessions, extent of involvement in operations of Academy secretariat, role in developing a business model for Academy</b></p>	<p>Before ASADI, CAS had its principal organs (General Assembly, the Colleges and the Executive Committee) which continue to function as before.</p>	<p>The organs have not changed. Some Members involved in skype conferences by ASADI for training</p>	<p>Financial and advice</p>	<p>4</p>	<p>Need for diversification of activities</p>	<p>Bringing Members to meetings</p>	<p>Minutes of Meetings</p>
<p><b>Secretariat including human capacity, retention, HR policies, staff training, structure/organogram, division of responsibility, team building exercises</b></p>	<p>The Executive Committee is the administrative body of the CAS. It is composed of the President, Executive Secretary and an Assistant, the Treasurer and the Heads of the Colleges.</p>	<p>During the period of ASADI, the position of programme Officer was created to help the Executive Secretary in supervising on going ASADI-financed activities. This statutes of CAS have not been changed to reflect this.</p>	<p>1. Two CAS staff members have attended training courses in Washington DC 2. Three CAS officials have been trained on financial management and budgeting by an official from USNAS 3. Video skype conferencing provided other interactive training.</p>	<p>5</p>	<p>The need to improve governance.</p>	<p>Resources to recruit more staff</p>	<p>CAS has now delivered a lot of credible advice in the form objective and unbiased reports: Workshops reports (2007, 2009, 2011, 2012, 2013, Consensus Study report(s) (2012)</p>

Finances e.g. budgets, financial sustainability, fundraising strategy, financial management systems, sources of income, diversity of funders	CAS relied heavily on the contributions of its members.	Presently CAS gets financial support from e.g. USNAS, Cameroon's Ministry of Scientific Research and Innovation, German National Academy of Sciences (Leopoldina), Royal Society (UK), NASAC	Financing of specific activities.	5	Need to diversify funders	1. Difficulties in coming up with matching funds. 2. Inadequate finances for staff salaries. 3. Insufficient stakeholder budgetary contributions for activities.	Financial Reports (projects)	Need for institutionalization of annual reports
Physical infrastructure including space, internet access, essential equipment e.g. computers and printers, meeting spaces, information systems management	There are 2 rooms housing the secretariat. There is access to Ministry of Education and Research (MINRES) conference room. CAS has 2 desk top computers and one laptop. There are facilities for telephone, skype and email.	Situation has not changed under ASADI. There is promise of more office space from government.	Information management (website)	5	Need for web-access	Problems in management of website		Need for staff experience on website management
Internal communication including website, communication strategy, membership database management, branding, publication/material production	There is a journal that is published quarterly.	Website, branding and more contact with media and stakeholders	Financial advice	4	Need to communicate Academy messages	Problems with website management		Need for qualified staff
External communication e.g. report dissemination plans, public relations, publicity materials, stakeholder databases	Not much.	1. Reports and the Journal are published, launched and distributed to stakeholders. 2. Public lectures are organized periodically. 3. A publicity brochure is available. 4. Fellows participate in radio/TV talk shows.	1. Training 2. Finances for studies and publication of reports	5	1. Need to promote the use of science in policy and decision making. 2. Desire to increase the visibility of CAS.	Inadequate funding.	5-6 reports disseminated 1 Consensus Study	Need for more staff to implement activities

<p><b>Active strategic partnerships/ collaborations especially where the Academy has identified niche areas i.e. identifying and maintaining relationships with key universities, key government ministries e.g. education, health ministries; other academies; research institutes and media</b></p>	<p>CAS has always had excellent collaboration with key government ministries (particularly those dealing with research, education, agriculture, health and environment) research institutes and universities with the major objective of influencing policy/decision making through evidence-based advice.</p>	<p>The collaboration has intensified because the support from ASADI has made CAS more active and visible. CAS is now more capable of delivering credible advice to these ministries.</p>	<p>1. Financial 2. Training.</p>	<p>6</p>	<p>1. The need to have an impact. 2. The cross-sectoral role of CAS and its special niche which is its independence and its capacity to provide advice based on a holistic and unbiased analysis of issues.</p>	<p>The need to remain independent.</p>	<p>Reports and correspondence on regular basis</p>	
<p><b>Nature and status of relationship with national, provincial and local government</b></p>	<p>The relationship is centered on providing advice and it is excellent.</p>	<p>Has intensified and has even included the Parliament especially on issues relating to climate change. CAS has provided documentation to educate parliamentarians on climate change issues.</p>	<p>Financial</p>	<p>3</p>	<p>The interest of the stakeholders in the issues handled.</p>	<p>Presenting scientific facts in language simple enough for the stakeholders to understand.</p>	<p>Reports disseminated based on objectives/sectors</p>	
<p><b>Nature and status of relationship with other external academies e.g. on the rest of the continent, interacademy networks e.g. IAP and affiliated organisations such as ICSU</b></p>	<p>Collaborate with other academies in capacity building and organisation of workshops and conferences.</p>	<p>More activities have been carried out and have exposed CAS to other academies and have facilitated collaboration with some of them.</p>	<p>1. Financial support. 2. Training. 3. Annual Meetings of Science Academies</p>	<p>5</p>	<p>The need to share experiences.</p>	<p>Difficulties in bringing policy makers to meetings</p>		

Nature and status of relationship with other actors/bodies in the national science system e.g. other national academies in your country, universities, research institutes etc	1. Provide advice on request to stakeholders. 2. Evaluation of reports done by other groups for government. 3. CAS is a member of several technical committees set up by government.	These activities have increased and include among others the facilitation of research activities and acquisition of scientific equipment as CAS manages a number of donor grants for some researchers.	Sensitization of stronger links with government	3	The perceived good governance of CAS.	Need highly qualified membership to continue to do this.		
Nature and status of relationship with the private sector	Insignificant.	Has not changed much.		1				
Nature and status of relationship with civil society and philanthropy	Insignificant.	No significant improvement						
Position and role of academy in national policy advisory space	Cross-sectoral and independent	Authoritative, independent voice	1. Financial support.	5				
Nature and extent of policy advisory activities e.g. consensus and convening activities	1. Production of reports.	Intensity has increased.	1. Financial support and training.	5				
Nature and extent of other academy activities e.g. science outreach, public lectures, young scientist activities, women in science activities etc	1. Prize awards 2. Public lectures	Increased with TWAS funding for the annual young scientists' award	Science outreach (dissemination of reports, etc)	4	Promotion of science culture	Difficulty of funding for young scientists & women in science activities		

## Ethiopian Academy of Sciences

Data category	Status/ situation before ASADI	Current status in 2014 highlighting main lines of development	Nature of ASADI support with regard to this development e.g. financial, in-kind support, advice provided	Overall importance of ASADI's contribution on this development (Please rate on a scale of 1-5 where 1=very low, 2=low, 3=neutral, 4=high and 5= very high)	Key drivers of change underlying this development e.g. need to diversify membership, potential impact on fundraising activities if change was achieved	Key challenges experienced in implementing this development	Related outputs and dates of publication/ delivery e.g. a strategic plan, annual reports, financial audit reports	Additional Comments
Aspects of Academy Development	Legal status of Academy e.g. Act of Parliament, not-for-profit	A registered not-for-profit non governmental organization.	Established by an Act of Parliament as an independent non-governmental organization (Proc. No. 783/2013).	4	The need for government recognition and support to ensure relevance and sustainability of the Academy's services to the the country.	No significant challenges were faced	Proclamation No. 783/2013; published on 01 March 2013	ASADI support was very instrumental to EAS activities during the transition
Strategic planning i.e articulation of vision, mission, objectives, and thematic priorities	EAS adopted its first strategic plan for 2011 - 2015 in 2010, which is before ASADI	The plan has been implemented since 2011	ASADI provided the resources to implement the programs identified in the strategic plan.	5	ASADI grant provided seed money to attract additional funds from other sources	Inadequate manpower and resources to implement the strategic plan	Annual activity and audit reports on implementation of the Strategic Plan. For 2011, 2012 and 2013	
Membership including numbers, election, involvement in Academy activities etc	49 fellow elected by the scientific community based on merit founded the Academy	Now the Academy has 77 Fellows; 2 Associate Fellows and 1 Honorary Fellow	Experience and information sharing on nomination and election of fellows and provision of grants for Working group activities	4	Expansion of EAS activities required for more expertise and representation of various fields of sciences	Inadequacy of resources for working group activities	Working groups led activities that produced various study reports and convention of public lectures	

<p><b>Academy leadership</b> i.e. Executive Committee, Council and Governing Board. Information should consider meetings, Constitution, election, Council structure, strategic planning sessions, extent of involvement in operations of Academy secretariat, role in developing a business model for Academy etc</p>	<p>The Officers of the Academy worked closely with the Secretariat to implement the Strategic Plan through programs and projects. The Board also used to meet every month to guide activities</p>	<p>Currently the Board meets quarterly and officers meet monthly. The Secretariat is better staffed and able to run the day to day activities of the Academy. The Board is comprised of eight elected fellows and 3 representatives from governmental organizations</p>	<p>Financial support and experience sharing via video tele-conferences. The financial support from ASADI enabled EAS to employ a full time Executive Director to lead the Secretariat</p>	<p>4</p>	<p>Re-establishment of the Academy by an Act of Parliament and strengthening of the Secretariat in terms of human resources and office facilities</p>	<p>EAS Officers and Board Members had to be involved in almost all activities and hold frequent meetings</p>	<p>Strong Secretariat and well defined organizational structure of the Academy</p>	
<p><b>Secretariat including</b> human capacity, retention, HR policies, staff training, structure/organogram, division of responsibility, team building exercises</p>	<p>Very small secretariat staff with no defined organizational structure and written operational procedures of operation</p>	<p>Well defined organizational structure and adopted operational policies and procedures</p>	<p>Financial support for activities and experience sharing via video tele-conferences</p>	<p>4</p>	<p>Expansion of EAS activities and the need for human resources to implement the projects and programs of the academy</p>	<p>No significant challenges faced</p>	<p>Project planned and executed successfully due to a relatively strong Secretariat</p>	
<p><b>Finances e.g.</b> budgets, financial sustainability, fundraising strategy, financial management systems, sources of income, diversity of funders</p>	<p>Very limited resources on project basis from various donors</p>	<p>Resource mobilization strategy adopted; financial policy and procedures in place; diversified sources of finance including government budgetary sub-vention</p>	<p>Provision of core budget to cover basic expenses of the Academy's operation</p>	<p>4</p>	<p>The need to ensure sustainability of the Academ's activities</p>	<p>Inadequacy of financial resources</p>	<p>Resource Mobilization strategy adopted in 2013; Financial Policy and Procedures adopted in 2012; government budgetary sub-vention confirmed by act of Parliament</p>	
<p><b>Physical infrastructure</b> including space, internet access, essential equipment e.g. computers and printers, meeting spaces, information systems management</p>	<p>Two small office rooms and some essential office equipment and furniture provided to the Academy by the Addis Ababa University</p>	<p>A compound of about 73000 m2 space and adequate office and meeting rooms; adequately furnished and equipped offices with broad band internet connection</p>	<p>Financial support to furnish and equip EAS office at the initial phase;</p>	<p>5</p>	<p>Provision of custodianship of office compound by the Government and success to mobilize resources for infrastructure development from other donors including the government</p>	<p>Mobilization of resources at the required level</p>	<p>Adequately furnished and equipped office facilities; and adequate space for future development</p>	

Internal communication including website, communication strategy, membership database management, branding, publication/material production	Had no website and communication with fellows was by sending information via e-mail	A fully functional website to inform fellows and the stakeholders on EAS activities and to make available important reports and other publications	Financial support for activities and publication of reports	4	The need to communicate with the increasing number of fellows and increase in EAS activities	The challenge to employ an experienced and capable communication officer and regularly update and upgrade the website	A functional website and publications from the academy activities	
External communication e.g. report dissemination plans, public relations, publicity materials, stakeholder databases	Had no publicity materials and database of stakeholders	Brochures, folders and the Strategic Plan regularly produced and disseminated to stakeholders	Financial support and experience sharing	4	Growing linkages with stakeholders and the need to increase relevance and sustainability of the Academy	Establishing an effective public relation unit	Brochures and various publicity materials	
Active strategic partnerships/collaborations especially where the Academy has identified niche areas i.e. identifying and maintaining relationships with key universities, key government ministries e.g. education, health ministries; other academies; research institutes and media	Limited partnership with those supported establishment of the Academy in one way or another	Multiple of partnerships and collaborations with diversified stakeholders based on identification of EAS roles in addressing national issues. Strong collaborations with Ministry of S&T, Ministry of Health, Addis Ababa University, etc.	Financial support and experience sharing	3	The need to increase the relevance of the academy through contributions to the national development effort. Consensus Studies and public lectures are the main routes	No significant challenges	Memorandum of understanding with some stakeholders including Ministry of S&T and Health; collaborative project with AAU in Climate change capacity building	
Nature and status of relationship with national, provincial and local government	Limited relations	Modest relations with national organizations and universities located in different regions of the country	Experience sharing	3	The need to increase the relevance of the academy	Maintaining and strengthening links created with regional organizations requires substantial resources	Linkages with universities and research institutes to work to gather in addressing climate change and other issues of national importance	

<b>Nature and status of relationship with other external academies e.g. on the rest of the continent, interacademy networks e.g. IAP and affiliated organisations such as ICSU</b>	Was member of NASAC and had limited relations with academies in the neighbouring countries	Member of NASAC and IAP and actively engaged with African Science Academies under the ASADI framework and NASAC	Experience sharing, networking and financial support to participation	4	The need to learn from experiences of others and to jointly work on common and global issues	No significant challenges	Membership to networks and participation in various activities	
<b>Nature and status of relationship with other actors/bodies in the national science system e.g. other national academies in your country, universities, research institutes etc</b>	Modest relations with national universities and research institutes	Good relations with many universities and research institutes as well as professional associations	Financial support to activities that brought together various organizations	3	The need to involve national bodies in the activities of the academy	Inadequate resources to sustain created relations	Growing involvement of national scientific bodies in the Academy's activities	
<b>Nature and status of relationship with the private sector</b>	Sponsorship of EAS establishment by some private companies	Not much progress made in increasing and strengthening relations except involvement of the private sector representatives in Academy activities	No specific contribution from ASADI except financial support to Academy activities in which representatives of the private	2	The situation needs to be changed	Inadequate resources to initiate activities that strengthen the linkage with the private sector	No significant outputs	
<b>Nature and status of relationship with civil society and philanthropy</b>	Relations with professional societies and associations in establishing the Academy	Good relations with many professional associations	No specific contribution from ASADI except financial support to Academy activities in which representatives of the private sector are part of	2	The situation needs to be changed		No significant outputs	
<b>Position and role of academy in national policy advisory space</b>	Did not occupy visible role in the national policy advisory role	The Academy is recognized as an independent body for evidence based policy advice to the Government by an Act of Parliament	Financial support and sharing of experience	3	The need for an independent policy advice from organized scholars by the Government and the objective of the Academy	No significant challenges	Requests from the government for advisory services	

<b>Nature and extent of policy advisory activities e.g. consensus and convening activities</b>	Only limited advisory and convening activities	In a position to undertake consensus studies and convening activities such as public lectures and workshops	Making available resources for consensus study and convening activities of the Academy	4	Vision and mission of the Academy and requests from the Government	Inadequacy of resources for working group activities	Several convening activities conducted and consensus studies being carried out	
<b>Nature and extent of other academy activities e.g. science outreach, public lectures, young scientist activities, women in science activities etc</b>	There were no public lectures	In a position to undertake public lectures and to create forums for the young academies	Financial support to conduct series of public lectures on biotechnology	3	Vision and mission of the Academy and requests from the Government	Inadequate resources to sustain initiatives	Successfully conducted public lectures and established your science forums	

<b>Nigerian Academy of Science</b>								
<b>Data category</b>	<b>Status/ situation before ASADI</b>	<b>Current status in 2014 highlighting main lines of development</b>	<b>Nature of ASADI support with regard to this development e.g. financial, in-kind support, advice provided</b>	<b>Overall importance of ASADI's contribution on this development (Please rate on a scale of 1-5 where 1=very low, 2=low, 3=neutral, 4=high and 5= very high)</b>	<b>Key drivers of change underlying this development e.g. need to diversify membership, potential impact on fundraising activities if change was achieved</b>	<b>Key challenges experienced in implementing this development</b>	<b>Related outputs and dates of publication/ delivery e.g. a strategic plan, annual reports, financial audit reports</b>	<b>Additional Comments</b>
<b>Aspects of Academy Development</b>								

<b>Legal status of Academy e.g. Act of Parliament, not-for-profit</b>	NAS is registered as a not-for-profit organization with the national licencing body. NAS is however not backed by an Act of Parliament or Charter	NAS has indicated the interest to be backed by Charter and this request is at the National Assembly under consideration. As of March 2014, 2nd reading had taken place and a public hearing is being planned some time within the year.	ASADI has given advice and funding to support the attainment of this. It also made it clear that it was important to the government backing and recognition	4= High	NAS focus and persistence in engaging the NASS. NAS increasing recognition and relevance for engagement by the policy makers	Death of the sponsor of the bill during the tenure of the last national assembly. Also the funding needed to lobby. In addition, the poor interest in science and lack of link between science and national development have stalled this. Urgent national occurrences that have demanded the attention of the national assembly leading to non processing of bills.	Draft NA Bill March 2012. Draft Lead paper and justification summary to the National Assembly. National Assembly Memos	
<b>Strategic planning i.e articulation of vision, mission, objectives, and thematic priorities</b>	The vision, mission and objectives for the existence of NAS were very clearly defined at the inception of NAS	There has been revisions of these in recent years but still within the set ideologies. There are regular strategic retreats.	ASADI has helped to provide financial and technical support towards the publishing of the last strategic plan 2007-2012 and helped NAS to remain focused and serve as mentor to other African Academies.	4=High	Increasing drive to manage the academy more effectively towards achieving set goals.	Limited number of fellows with capacity to participate actively on voluntary basis. And no guaranteed funding to pursue /implement the strategic plan	Strategic Plan 2007-2012. Draft of 2013-2017 Plan. Annual Reports/ Year book	
<b>Membership including members, election, involvement in Academy activities etc</b>	Membership has always followed a stringent process and remains so. It is strictly merit based	Limitation has changed from limited total number (100 at given time) to limited rate of increase ( limited to 10/year)	Not applicable	3=Neutral	Drive to increase membership given the large population of the country and attendant scientists numbers.	Identifying and nominating qualified scientist from under represented zones and disciplines. Getting female membership	Annual reports/ Year book. Programme for induction of new fellows	

<p><b>Academy leadership</b> i.e. Executive Committee, Council and Governing Board. Information should consider meetings, Constitution, election, Council structure, strategic planning sessions, extent of involvement in operations of Academy secretariat, role in developing a business model for Academy etc</p>	<p>Presidency for two years single term in the past</p>	<p>Presidency for 4 years single term. A president elect position created. Sectional committees created</p>	<p>Advisory</p>	<p>4= High</p>	<p>Exposure of the Fellows which convinced them that a longer term will help to achieve goals.</p>	<p>Getting enough fellows to participate actively in sectional committees and a strenuous process of constitutional review.</p>	<p>Revised statutes and bye laws</p>	
<p><b>Secretariat including human capacity, retention, HR policies, staff training, structure/organogram, division of responsibility, team building exercises</b></p>	<p>Very few staff, very limited infrastructure, no staff trainings and team building opportunities existed then. No professional staff, mainly administrative</p>	<p>Defined organogram with a management committee and technical staff engaged. Significant improvement in the infrastructure with on-going modernization. Opportunities for capacity building/trainings exist. Clearly defined reporting lines and HR policies available now. Change from permanent employment to contract</p>	<p>ASADI partnership has provided Technical, Financial, Advisory support. In addition it has supported training and capacity building opportunities for staff</p>	<p>5= Very high</p>	<p>Th drive is due to the fact it was part of the terms of the ASADI partnership</p>	<p>Appropriate remuneration needed for the staff</p>	<p>More technical staff handle projects and administration matters.</p>	

<p><b>Finances e.g. budgets, financial sustainability, fundraising strategy, financial management systems, sources of income, diversity of funders</b></p>	<p>Funding was mainly from ASADI and membership dues and induction fees. There were minimal financial management systems.</p>	<p>Fund raising committee set up with a sustainable fund raising plan documented. There is a yearly NAS budget. More funders have supported NAS on projects and activities eg WHO, NASAC, UNICEF, Save the Children, Ford Foundation, etc and Local foundations and Agencies of the federal government. Membership dues and induction fees have also been reviewed upward</p>	<p>ASADI gave enormous financial support to NAS and helped in training staff in financial system management</p>	<p>4=High</p>	<p>Diverse funding sources for sustained existence and better engagement will be most helpful.</p>	<p>Funding needed to undertake the fund raising activities and this is not readily available.</p>	<p>More partners engaged and projects are implemented</p>	
<p><b>Physical infrastructure including space, internet access, essential equipment e.g. computers and printers, meeting spaces, information systems management</b></p>	<p>Very limited space and sparsely equipped. Internet and power supply was a challenge.</p>	<p>Significant improvement in Infrastructure - regular power supply, internet access, website, meeting space and staff office. There are desk tops and laptops with accompanying accessories. There are storage cabinets for hard copying information and also electronic backups.</p>	<p>ASADI partnership provided financial support for infrastructural upgrade.</p>	<p>4=High</p>	<p>Increasing engagement by the government and development partners</p>	<p>NAS needs to have an office in Abuja which will better enhance visibility and easy reach to government and organizations based there</p>	<p>A liason office was established in Abuja a few years back. There is a staff member who is based there</p>	

<p><b>Internal communication including website, communication strategy, membership database management, branding, publication/material production</b></p>	<p>There were not very many publications. There was no stable and communication was generally based on postage. NAS branded materials not available</p>	<p>Membership database routinely updated. Website active and highly accessed for information. Support for staff communication available now. There is a biannual newsletter published, plans are on to making electronic newsletters. Project summaries and policy briefs are published.</p>	<p>Technical and financial especially on reports from Forum on Evidence based health Policy making.</p>	<p>4= High</p>	<p>The use of the website to advertise events, post reports and publications for access by the public has help to popularize NAS</p>	<p>A more active and informative website that is routinely update is highly needed. A bigger capacity website will also be helpful</p>	<p>Active website.</p>	
<p><b>External communication e.g. report dissemination plans, public relations, publicity materials, stakeholder databases</b></p>	<p>The academy was not structured in coordinating publicity and packaging a stakeholder database. Not much was known about the activities of the academy</p>	<p>NAS has established and strengthened relationship the media. A media science prize has been instituted and 3 winners have emerged since inception. There are regular press releases on NAS events and topical national issues.</p>	<p>Advisory, technical and financial</p>	<p>4=High</p>		<p>Media science prize award and report on the meeting to strengthen Science/Scientist/Media collaboration</p>		
<p><b>Active strategic partnerships/collaborations especially where the Academy has identified niche areas i.e. identifying and maintaining relationships with key universities, key government ministries e.g. education, health ministries; other academies; research institutes and media</b></p>	<p>There has been some degree of interaction with these listed</p>	<p>Such strategic partnerships have improved significantly.</p>	<p>Advisory</p>	<p>4=High</p>	<p>With ASADI partnership, NAS had its reputation and integrity enhanced which made it possible to have these organizations will to collaborate effectively</p>	<p>Universities hosting some of NAS/NYA (young academy) meetings and give financial support</p>		

<b>Nature and status of relationship with national, provincial and local government</b>	Some interaction with government at all levels	NAS works well with all governments, e.g. FMOH, FMST. and Lagos state under the WHO/ Alliance HSPR funded PREVIEW project. Some of the LGA personnel serve as participants to NAS workshops and conference	Advisory	3= Neutral	The AMASA 8 and other national and regional convening activities NAS hosted has been the drive for improved linkages and synergies.	NAS represented on the Lagos State Malaria Research and Advisory committee	
<b>Nature and status of relationship with other external academies e.g. on the rest of the continent, interacademy networks e.g. IAP and affiliated organisations such as ICSU</b>	There was some involvement with academies on the continent as well as with international affiliate networks	ASADI was structured to ensure active and effective collaboration of Academies in Africa. NAS is a member of NASAC and has held leadership positions. NAS is a member of IAP, IAMP, ICSU and IAC; NAS has been on the executive committees of these.	Technical and financial.	5= High	NAS provided supportive supervision to some of the younger academies and has continued with such services.	NAS receives publications from other Academies, participated in NASAC/EASAC meetings.	
<b>Nature and status of relationship with other actors/bodies in the national science system e.g. other national academies in your country, universities, research institutes etc</b>	NAS communicates with other national academies in-country. NAS worked with science associations but there has been a lull.	NAS now drives a process to bridge the gap between the national academies and collaborate more with the national science associations.	Advisory	3 Neutral			It has not be possible to get active and functional database of the very viable and active sciences associations. Funding to convene more regular meetings

<p><b>Nature and status of relationship with the private sector</b></p>	<p>NAS related with the private sector in the past and is still on going.</p>	<p>There has been increased engagement with the private sector, with some organization giving financial support to NAS activities. Some partner with NAS to implement projects, for example Schlumberger NAS collaboration for excellence in science education. GSK support for the evidence based health forum among others.</p>	<p>Advisory</p>	<p>3= Neutral</p>				
<p><b>Nature and status of relationship with civil society and philanthropy</b></p>	<p>Very minimal interaction previously</p>	<p>There has been more engagement with the CSO and Philanthropic organizations. NAS has had local and international foundations sponsor some of the activities.</p>	<p>Advisory</p>	<p>4= High</p>	<p>Evidence of prudent resource management and accountability has made it possible to have endorsement for further funding of some projects even with the exit of ASADI</p>			
<p><b>Position and role of academy in national policy advisory space</b></p>	<p>NAS fellows played this role in the past with greater commitment.</p>	<p>More of the fellows serve as consultants to government agencies. Fellows participate as panel members for the setting up of professional training institutes like colleges of medicine, and are vice chancellors to some universities. NAS is consulted by the federal government for her opinion on some topical national issues</p>	<p>Advisory</p>	<p>3=Neutral</p>				

<p><b>Nature and extent of policy advisory activities e.g. consensus and convening activities</b></p>	<p>The academy was not structured in coordinating publicity and packaging a stakeholder database. Not much was known about the activities of the academy</p>	<p>NAS has not conducted any consensus activity but has convened a number of workshops and fora whose discussions and recommendations have led to the production of policy statements. The Infant and Maternal Mortality workshop deliberations and reports influenced pregnant women and child care policy in Nigeria.</p>	<p>Advisory, technical and financial</p>	<p>5=very high</p>			
<p><b>Nature and extent of other academy activities e.g. science outreach, public lectures, young scientist activities, women in science activities etc</b></p>	<p>NAS convened public lectures in various parts of the country previously. The young scientists and women in science events were very minimal then</p>	<p>The number of public lectures has not increased significantly though they are still held. NAS has supported the establishment of the Nigerian Young Academy and participated in nominating young scientists for international competitions and awards.</p>	<p>Advisory</p>	<p>3= Neutral</p>		<p>Not very many women scientists are aware of the NAS or willing to apply to the fellowship.</p>	

## Academy of Science of South Africa

Data category	Status/ situation before ASADI	Current status in 2014 highlighting main lines of development	Nature of ASADI support with regard to this development e.g. financial, in-kind support, advice provided	Overall importance of ASADI's contribution on this development (Please rate on a scale of 1-5 where 1=very low, 2=low, 3=neutral, 4=high and 5= very high)	Key drivers of change underlying this development e.g. need to diversify membership, potential impact on fundraising activities if change was achieved	Key challenges experienced in implementing this development	Related outputs and dates of publication/ delivery e.g. a strategic plan, annual reports, financial audit reports	Additional Comments
Aspects of Academy Development	Established in 1996. Act of parliament passed in October 2001. Became operational in May 2002. ASSAf recognised as official national science Academy of SA.	Act is still in place and has undergone some minor amendments.	Act was promulgated before the ASADI program.	N/A	Official recognition and opportunity to secure government funding.	Time consuming and required perseverance.	ASSAf Act.	
Strategic planning i.e articulation of vision, mission, objectives, and thematic priorities	ASSAf had developed its first strategic plan and annual business plan prior to the ASADI program.	Vision, mission, objectives are essentially unchanged. Formal requirement from SA Department of Science and Technology for 5 yr strategic plan and annual performance plan. Thematic priorities have broadened and in line with the government's National Development Plan.	First strategic plan and annual business plans completed before ASADI program.	4	Aids planning and now a compliance matter.	Compliance reporting is onerous - strategic plan: annual performance plans; quarterly reports; annual reports; annual reports; shareholder compact etc.	All plans and reports approved by Minister and published.	Compliance requirements have increased dramatically in last few years and have placed on a huge burden on senior staff, especially Eexecutive Officer.

<p><b>Membership including membership profile, numbers, election, involvement in Academy activities etc</b></p>	<p>Election criteria include significant achievement in advancement or application of science. In addition, Members should assist ASSAf to achieve its objectives. Total membership in 2004 was 235.</p>	<p>Currently 429 Members. Annual elections. About 40% of Members involved in Academy activities of some type.</p>	<p>2</p>	<p>Need to honour distinguished scholars; ensure fair and effective election process; increase pool of Academy Members willing to volunteer services for benefit of science system.</p>	<p>Securing commitment of volunteers to contribute to ASSAf activities; improving racial and gender profile of membership.</p>	<p>Clear Member election process. Regularly updated Member database.</p>	
<p><b>Academy leadership i.e. Executive Committee, Council and Governing Board. Information should consider meetings, Constitution, election, Council structure, strategic planning sessions, extent of involvement in operations of Academy secretariat, role in developing a business model for Academy etc</b></p>	<p>Council comprising 12 members, each of whom holds office for four years + 1 member appointed by Minister of S&amp;T as representative of NACI. Council is elected by the Members every 2 years. Strategic plans and business plans prepared by secretariat and endorsed by Council.</p>	<p>Same as before except subcommittees of Council (HR, Audit and Exco) introduced. Elections every 4 years. Regular revision/updates of regulations. Election procedures improved. Strategic planning sessions introduced. Formal business plans (annual performance plans) required by DST. Prepared by secretariat - endorsed by Council.</p>	<p>4</p>	<p>Good governance and compliance with legislation.</p>	<p>Attendance at Council meetings could be improved.</p>	<p>Minutes of all meetings. Constitution - set of regulations.</p>	
<p><b>Secretariat including human capacity, retention, HR policies, staff training, structure/organogram, division of responsibility, team building exercises</b></p>	<p>5 F/T staff &amp; P/T finance officer. Relatively high staff turnover until about 2009. No team building exercises. Followed HR policies of National Research Foundation (NRF).</p>	<p>28 F/T staff + 5 interns + 2 new positions. HR function moved from NRF to ASSAf in Aug 2009 - own HR policies, team building, staff training, turnover improved. Editorial staff → P/T - 12 P/T staff. Performance mgt system.</p>	<p>4</p>	<p>Need to retain staff; need to comply with labour legislation; to clearly articulate responsibilities as activities increased.</p>	<p>No F/T senior HR expertise. Duties shared amongst staff.</p>	<p>HR policies; job descriptions; performance assessments.</p>	<p>HR policies are in need of review. In process of contracting P/T external service provider for HR services.</p>

<p><b>Finances e.g. budgets, financial sustainability, fundraising strategy, financial management systems, sources of income, diversity of funders</b></p>	<p>Financial support from DST + contract funding for Scholarly Publishing. Approx 2x ASADI grant. Limited external funding from Open Society Foundation, Andrew W Mellon Foundation and from the Sydney Brenner grant.</p>	<p>ASSAf largely dependent on DST for core funding but raises considerable amounts of project-based funding from diverse sources. Has sustainability fund. Stringent financial mgt systems due to legal requirements.</p>	<p>Staff training. Oversight and advice.</p>	<p>3</p>	<p>Good governance and compliance with legislation.</p>	<p>Compliance requirements are demanding</p>	<p>Unqualified audited financial statements each year.</p>	
<p><b>Physical infrastructure including space, internet access, essential equipment e.g. computers and printers, meeting spaces, information systems management</b></p>	<p>First ASSAf offices were in Pretoria CBD (4 offices and 1 meeting room); DST funded rent, furniture and IT infrastructure. Relocated to DST building in 2005 ; DST hosted ASSAf with no rental and infrastructure costs.</p>	<p>Relocated to own rented office premises in Aug 2009. Purchased all IT &amp; other equipment &amp; furniture. Assets register. Manage own IT network with assistance of external service provider.</p>	<p>No ASADI funds used for equipment. DST provided funds for IT needs and furniture when ASSAf moved into own premises in 2009.</p>	<p>1</p>	<p>DST required space in their building and ASSAf needed to expand.</p>	<p>Needed to employ own IT specialists and internally manage information backups and IT risks. Needed to employ own cleaning staff and take responsibility for own security.</p>	<p>Own office space. Dedicated meeting rooms. Comprehensive assets register.</p>	<p>Own premises an important signal of independence from DST. Annual rentals are high, therefore purchase of own building a key imperative in the short term.</p>
<p><b>Internal communication including website, communication strategy, membership database management, branding, publication/ material production</b></p>	<p>ASSAf website outsourced. Member database existed. Specialist communication staff appointed during ASADI program (2007) but no communication strategy or branding guidelines.</p>	<p>ASSAf has a well-established communication program with dedicated staff. Strong branding presence; high quality publications. Regular updates of website. Well maintained and current member data base.</p>	<p>Importance of communication stressed during ASADI program.</p>	<p>3</p>	<p>Need to raise profile of ASSAf and firmly establish its brand.</p>	<p>Website is in need of major revamping to bring it in line with recent IT developments.</p>	<p>Branding guidelines; Member data base; website; high quality reports.</p>	

<p><b>External communication e.g. report dissemination plans, public relations, publicity materials, stakeholder databases</b></p>	<p>Production and distribution of ASSAF publications was outsourced.</p>	<p>Consensus study reports are formally launched; have media presence &amp; media releases; media uptake monitored. Formal dissemination plan prepared for each study report. Emerging social media presence e.g. twitter</p>	<p>Report launches informed by training received during ASADI program.</p>	<p>4</p>	<p>Need to raise profile of ASSAF and increase uptake of report recommendations.</p>	<p>Relatively few science journalists in SA; lack of interest by media in science-related stories.</p>	<p>Media releases; emerging M&amp;E function documenting media reports.</p>	<p>Needs improvement, especially insofar as social media is concerned. Also in process of considering publishing changes from hard copies to electronic copies.</p>
<p><b>Active strategic partnerships/ collaborations especially where the Academy has identified niche areas i.e. identifying and maintaining relationships with key universities, key government ministries e.g. education, health ministries; other academies; research institutes and media</b></p>	<p>Initial partnership with the IAC was on the study "Promoting SA S&amp;T capacities for the 21st century" published in 2004 and the Scholarly Publishing report published in 2006 was a partnership between the DST and the Department of Education.</p>	<p>Very good recognition by Dept of S&amp;T (many requests to undertake studies); growing recognition by other gov depts. Media relations considerably improved but still in need of strengthening.</p>	<p>Focus of ASADI activities on health-related topics greatly assisted relationship with Dept of Health.</p>	<p>3</p>	<p>Desire to give expression to Academy's mandate; to fulfill goals of ASADI program; to firmly establish Academy's role in NSI and policy advisory space in SA.</p>	<p>Lack of time and capacity to develop relationships with all government departments and all institutions.</p>	<p>MoU with Dept of Higher Education and contract funding. Gov officials' attendance at ASSAF symposia.</p>	<p>Important for ASSAF not to favour particular universities and to try to partner with as many as possible e.g. try to spread visits of Distinguished Visiting Scholars to historically disadvantaged and rural universities.</p>
<p><b>Nature and status of relationship with national, provincial and local government</b></p>	<p>Good relationships with DST, and with Dept of Education through Quest magazine and Scholarly Publishing Programme. No provincial or local government partnerships.</p>	<p>Very good recognition by DST; growing recognition by other gov depts (e.g. Health, Energy, Env Affairs, Higher Education). Limited links with provincial &amp; local govs (only Gauteng thru' LAMAP &amp; Durban thru' Low Carbon Cities study.</p>	<p>ASADI greatly assisted with capacity to produce evidence-based reports which strengthened relationships</p>	<p>4</p>	<p>Desire to give expression to Academy's mandate; to fulfill goals of ASADI program; to firmly establish Academy's role in NSI and policy advisory space in SA.</p>	<p>Lack of time and capacity to develop relationships with all government departments.</p>	<p>MoU with Dept of Higher Education and contract funding. Gov officials' attendance at ASSAF symposia.</p>	

<p><b>Nature and status of relationship with other external academies e.g. on the rest of the continent, interacademy networks e.g. IAP and affiliated organisations such as ICSU</b></p>	<p>ASSAf was a member of IAP and was a founding member of NASAC. ASSAf had an agreement with the Russian Academy of Sciences.</p>	<p>ASSAf serves as co-chair of IAC, is on exco of IAP, IAMP and NASAC. Currently planning for hosting of ICSU ROA and to become adhering body to ICSU. Number of MoUs with academies.</p>	<p>ASADI greatly assisted with raising ASSAf's profile on continent and globally.</p>	<p>4</p>	<p>Need for representation from Africa/developing countries - ASSAf as one of strongest academies in Africa satisfied this need. Strong internal desire to play a global role.</p>	<p>Funding of leadership to attend Exco meetings. Underestimated extent of secretariat support required to fulfill these leadership roles.</p>	<p>Leadership positions.</p>	<p>It will be difficult for younger, less well funded academies to ever play a global leadership role given the secretariat support that is expected.</p>
<p><b>Nature and status of relationship with other actors/bodies in the national science system e.g. other national academies in your country, universities, research institutes etc</b></p>	<p>Program of scholarly lectures in collaboration with Royal Society in place.</p>	<p>Royal Society &amp; Akademie - co-host lectures. SAAE &amp; SAYAS - host secretariats &amp; project collaboration. Research institutions - interaction thru' COHORT &amp; CEOs meetings. NRF - co-host meetings. University roadshows.</p>	<p>ASADI helped indirectly by raising profile and helping with capacity building.</p>	<p>3</p>	<p>Stronger relations with other bodies in NSI driven by need for ASSAf to raise its profile and the need for role clarification.</p>	<p>Royal Society &amp; Akademie relationships cordial but not ideal. They were meant to disband when ASSAf was formed.</p>	<p>MoUs with National Advisory Council on Innovation (NAC) and SA Young Academy (SAYAS).</p>	
<p><b>Nature and status of relationship with the private sector</b></p>	<p>Very limited to non-existent.</p>	<p>Grown but not ideal. Main interactions been when soliciting funding. Recent symposia &amp; projects have had fairly good private sector involvement as participants.</p>	<p>Given us a useful model for broadening membership of forums. Not fully implemented by ASSAf.</p>	<p>3</p>	<p>Recognition of private sector role in R&amp;D and innovation. Recognition of need to include their expertise in projects.</p>	<p>Private sector not used to volunteering their services. Lack of experience &amp; knowledge on part of ASSAf. Time consuming. Lack of senior staff to develop this role.</p>	<p>Private sector membership of panels/committees. Private sector presentation of papers at symposia/workshops. Funds raised from private sector.</p>	
<p><b>Nature and status of relationship with civil society and philanthropy</b></p>	<p>Limited relationship with civil society. Relationship with Oppenheimer Memorial Trust (Sydney/Brenner Fellowship); Ford Foundation (project funding) &amp; Mellon Foundation (planning grant).</p>	<p>Improved. Regularly involve civil society in symposia e.g. WWF, support groups for IMNS disorders workshop. Philanthropy - mainly Oppenheimer Memorial Trust.</p>	<p>Provided example. Presented opportunities that ASSAf has not fully exploited.</p>	<p>3</p>	<p>Incorporation of all voices in symposia. Desire for more participatory approach.</p>	<p>Time consuming. Lack of senior staff to develop this role.</p>	<p>Papers by civil society representatives at workshops/symposia. Evidence of grants.</p>	<p>Need to pay more attention to developing relationship with philanthropic organisations.</p>

<p><b>Position and role of academy in national policy advisory space</b></p>	<p>Limited recognition except by DST &amp; limited role. But in 2004 ASSAF held a workshop on IAP report on Higher Education in Developing Countries. Attendance was over 120 delegates.</p>	<p>Very good recognition by Dept of S&amp;T, growing recognition by other gov depts (e.g. Health, Energy, Env Affairs). Clear role clarification between ASSAF and NACI.</p>	<p>Helped by increasing profile and providing training on methodologies for studies, which in turn showed government the value of Academy reports and advice.</p>	<p>4</p>	<p>Desire to give expression to Academy's mandate; to fulfill goals of ASADI program; to firmly establish Academy's role in NSI and policy advisory space in SA.</p>	<p>Role clarification in policy advisory space in SA. Overlapping responsibilities. Expanding role beyond Dept of S&amp;T.</p>	<p>MoU with NACI clarifying roles. Recommendations of Ministerial Review report and DST's official response.</p>	<p>Frequent reference to role of ASSAF in public statements by Minister and officials in Dept of S&amp;T.</p>
<p><b>Nature and extent of policy advisory activities e.g. consensus and convening activities</b></p>	<p>ASSAF requested by Dept of Educ (DOE) and DST &amp; 2 statutory organisations (NRF and CHE) to give policy advice. DOE: study on national shortage of high-level skills; DST: study of research publishing in SA (2002-2006).</p>	<p>Completed 7 consensus studies &amp; hosted many symposia &amp; published proceedings reports. Currently running 6 consensus studies and 4 evaluation studies in SPP. Scope of studies broadened considerably.</p>	<p>Training on study methodologies; training of project officers; provided idea for policymakers' booklet.</p>	<p>5</p>	<p>Recognition that such activities and reports/products are key to enhanced profile and recognition by government.</p>	<p>Securing commitment of volunteers; writing of reports and until recently, sufficient staff.</p>	<p>Study reports and workshop proceedings reports.</p>	<p>Activities have considerably increased over time. Government (DST) regularly requesting ASSAF to undertake studies.</p>
<p><b>Nature and extent of other academy activities e.g. science outreach, public lectures, young scientist activities, women in science activities etc</b></p>	<p>Publication of Quest science magazine and involvement in science events. Sydney Brenner postdoctoral fellowship in place. Little or no focus on young scientists and women.</p>	<p>Science outreach - Quest &amp; science events; public lectures - Distinguished Visiting Scholar program; annual young scientists' conference. Sydney Brenner postdoctoral fellowship; host OWSD (gender) national chapter</p>	<p>US NAS assisted with channelling funding for Sydney Brenner fellowship and assisted with selection process of fellows.</p>	<p>3</p>	<p>Need to raise profile and respond to key challenges of SA i.e. raising public awareness of science. Need to foster next generation of scientists.</p>	<p>Funding and pressure on staff. Science awareness - duplicated mandate with other bodies in NSI.</p>	<p>Quest science magazine. Young scientists' conference. Establishment of SAYAS. Visit by DVS. Selected as regional focal point for GenderInSITE.</p>	<p>Currently focussing on improving impact of Quest science magazine.</p>

## Uganda National Academy of Sciences

Data category	Status/ situation before ASADI	Current status in 2014 highlighting main lines of development	Nature of ASADI support with regard to this development e.g. financial, in-kind support, advice provided	Overall importance of ASADI's contribution on this development (Please rate on a scale of 1-5 where 1=very low, 2=low, 3=neutral, 4=high and 5= very high)	Key drivers of change underlying this development e.g. need to diversify membership, potential impact on fundraising activities if change was achieved	Key challenges experienced in implementing this development	Related outputs and dates of publication/ delivery e.g. a strategic plan, annual reports, financial audit reports	Additional Comments
Aspects of Academy Development								
<b>Legal status of Academy e.g. Act of Parliament, not-for-profit</b>	UNAS operational but recognized only by Certificate of Incorporation	Has Charter from the President of Uganda. Has all necessary background documents for Bill of Parliament and they are at Ministerial level	Financial and technical support in developing the documents	4	Need to have legal basis and support from Government for sustainability	Extremely slow Government processes and change in personnel in the lead Ministry including Hon Ministers	Signed Charter by the President	This issue has been given highest priority by the new Council
<b>Strategic planning i.e. articulation of vision, mission, objectives, and thematic priorities</b>	Had the initial vision, mission and thematic priorities set in 2000	Has revised and updated printed vision, mission and strategic plan ending in 2014	Financial and technical support in terms of experts coming to assist and facilitate meetings	5	To be in line with other Academies and networks hence effective access to potential donors and partners	Strategic plan not fully printed	Vision and Mission document, draft Strategic Plan	Planning to develop new strategic Plan for 2014 to 2019
<b>Membership including members, election, involvement in Academy activities etc</b>	Inducted Fellows only 18	Inducted Fellows 57	Financial support to hold induction meetings	3	Diversify and increase Membership	Few females are nominated	Fellowship register and database	Effort being made to increase this number significantly

Academy leadership i.e. Executive Committee, Council and Governing Board. Information should consider meetings, Constitution, election, Council structure, strategic planning sessions, extent of involvement in operations of Academy secretariat, role in developing a business model for Academy etc	Council complete but some members not Fellows.	Full council with all members being Fellows, Revised and updated Constitution. Regular council meetings	Financial to hold the meetings	4	Need to have a fully operational management structure	The growth of the activities may soon overran the current Management Structure	Meeting Minutes dully signed and filed	Need to re-examine management structure as the new Strategic Plan is developed
Secretariat including human capacity, retention, HR policies, staff training, structure/organogram, division of responsibility, team building exercises	1 staff members and no human resources manual or structure	Secretariat of 9 persons with 5 technical / professionals; a Human resources Manual and staff retreats held annually	Financial support and technical input by experts	5	Need to have a fully fledged office	Relatively low remuneration for the high caliber staff needed and retained	Human resources Manual and confidential files for all staff	
Finances e.g. budgets, financial sustainability, fundraising strategy, financial management systems, sources of income, diversity of funders	Extremely low Financial base	Have managed to raise some funds for a number of activities and have a Financial Manual and annual budgets with annual audit reports by recognized auditors	Financial support and technical input by experts	5	Need to be sustainable institution	Taking advantage of situations and building on them	Financial Manual, Annual Budget documents and Audit Reports	
Physical infrastructure including space, internet access, essential equipment e.g. computers and printers, meeting spaces, information systems management	1 desk top computers	8 desktop computers several printers and scanner. Have an office at Makerere University	Financial support	4	Have a corporate image	Space still too small now that the staff numbers are beginning to grow	Equipment in office and operational and well looked after	

Internal communication including website, communication strategy, membership database management, branding, publication/material production	Had a website but no strategy or database	Have an operational database, a membership database and very many publications	Financial and technical experts support	5	5	Having a corporate image and delivering to target policymakers	Servicing and maintaining these facilities is sometimes expensive	Operational website and membership database	
External communication e.g. report dissemination plans, public relations, publicity materials, stakeholder databases	Limited dissemination activities	Increased publications' dissemination activities	Financial and technical support in terms of experts coming to assist and facilitate meetings	5	5	Need to achieve the Academy's mandate	Difficult in a short time to show impact of the dissemination		
Active strategic partnerships/collaborations especially where the Academy has identified niche areas i.e. identifying and maintaining relationships with key universities, key government ministries e.g. education, health ministries; other academies; research institutes and media	Minimal partnerships	Have a large partnership collaboration with some of the major ministries in Government (Health, Education, Gender, Agriculture, Finance) and in Parliament of Uganda	Financial and Technical support.	5	5	Need for the Academy to build networks and collaborating links with Government and other agencies	Slow response from Government ministries and agencies	Needs a long time strategy to achieve this effectively.	
Nature and status of relationship with national, provincial and local government	None	Have established working relationships with 3 major regions in the country (South - Mbarara, North - Gulu and East - Busitema	Partly financial through support to work of the Secretariat as a whole	4	4	Need for the Academy to be seen as national in its operations	Raising resources and activities to be done in the regions	Collaborating activities	

Nature and status of relationship with other external academies e.g. on the rest of the continent, interacademy networks e.g. IAP and affiliated organisations such as ICSU	Relatively few	Currently have working relationships with all the major academy networks and working on AMASA 10 with NASAC	Both financial and technical support	5	Need for the Academy to build networks and collaborating links with other Academies	Low financial base sometimes makes collaboration difficult.	Collaborating activities and meetings: have MoU with South Africa & building one with Nigeria.	
Nature and status of relationship with other actors/bodies in the national science system e.g. other national academies in your country, universities, research institutes etc	Relatively low. Mainly Makerere, NARO, UNCST	Has grown to include all the 6 state Universities and several private universities	Partly financial through support to work of the Secretariat as a whole	3	Need for the Academy to build networks and collaborating links with Universities and research institutes	Lack of resources to bring the collaboration to higher levels	Collaborating activities	
Nature and status of relationship with the private sector	None	Have established working relationships with the private sector through the CEO Summit secretariat	Mainly consultation	2	Need for support towards sustainability	Slow response from the private sector	Setting up high level meetings	
Nature and status of relationship with civil society and philanthropy	None	Low number of civil society UNAS is collaborating with	Mainly consultative	2	Need for partnerships and networking	Building trust and confidence	Collaborative activity reports	
Position and role of academy in national policy advisory space	Very limited	Beginning to grow rapidly. Being invited by various Ministries for example Ministry of Foreign Affairs	Both financial and technical support	5	Need to play its rightful position at national level	Slow built up of confidence and trust from the Government	Policy Advisor briefs from Academy to Government	
Nature and extent of policy advisory activities e.g. consensus and convening activities	Low	Very common at rates of about 2 to 3 every year, including new programs	Both financial and technical support	5	Need to carry out its full functions as a national academy	Resources limited	Meeting Minutes and reports of various activities	

<p>Nature and extent of other academy activities e.g. science outreach, public lectures, young scientist activities, women in science activities etc</p>	<p>Low</p>	<p>Relatively little has been undertaken in this area. Have now started in preparation for AMASA 10</p>	<p>Mainly financial support</p>	<p>1</p>	<p>Need for more collaborations and nurturing young scientists for example</p>	<p>Limited resources</p>	<p>Reports of collaborative activities</p>	
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