

## 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.