

**Guidelines
for
Establishing
and
Strengthening
Academies**



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EXPERT GROUP PAPER

Ref: EGI/10/09

I. Preamble

NASAC Action Item I:

Help create new academies and support existing members with developing strategic plans and concrete work plans.

NASAC's Strategic Action Agenda identifies the aforementioned action item as a priority and hence the Expert Group (EG) recommends that the item be split into two parts:

- Help in the creation of new academies in Africa; and
- Supporting existing members with the development of strategic plans and work plans.

Merit-based science academies are key components in stimulating a culture of scientific and technological excellence in Africa. For this reason, the value of creating science academies in countries where none exist cannot be overemphasised. It is on this basis that the EG recommends that NASAC employs the guidelines and strategies below so as to have a structured framework towards implementing this action item.

II. Guidelines and Strategies to Help in Creating New Academies

GUIDELINES	STRATEGIES
1. In-country sensitisation	1.1 Lead academies' officials/executives/members to visit the targeted countries on a sensitisation mission. 1.2 Lead academies should communicate the benefits of an academy to targeted countries and act as role models or mentors for the new academies.
2. Access/ create databases of eminent scientists in different African countries	2.1 NASAC to initiate contacts and discussions with groups of scientists on the possibility of creating science academies in their countries. The groups should form nuclei for follow-up actions. 2.2 NASAC to identify and contact institutions in targeted countries that have enough numbers of scientists, e.g. universities, research institutions, etc. This should minimise transaction costs within NASAC for initial contacts. 2.3 Electronically advertise the value of creating academies to the scientific communities in the targeted countries.
3. Hold awareness workshops	3.1 Host workshops in targeted countries and invite scientists from neighbouring countries to participate. 3.2 Lead academies to facilitate host-countries in achieving NASAC's objectives. 3.3 Identify credible scientists in host-countries who can serve as local organising committee members for the workshop. 3.4 NASAC to develop a plan of action with timelines for follow-up after the workshops in consultation with the lead academies and in-country scientists. 3.5 NASAC to establish seed-funding for initial follow-up activities for the targeted countries.

GUIDELINES	STRATEGIES
<p>4. Enhance communication about the benefits of establishing science academies</p>	<p>4.1 NASAC to acknowledge and publicise existing scientific works and breakthroughs—especially in research-based initiatives. This recognition will enhance status and profiles of the scientists.</p> <p>4.1.1 NASAC to set up a digital library for electronic journals and avail the same to members.</p> <p>4.1.2 NASAC to provide a platform for dissemination of scientific research findings.</p> <p>4.2 NASAC to facilitate exploitation of intellectual property rights and patenting of inventions for commercialisation and direct benefit to scientists.</p> <p>4.3 NASAC to award prizes for scientific inventions and excellence as a means of supporting research work in their member countries.</p> <p>4.4 Market the academies at individual and national level and highlight the benefits of belonging/creating academies.</p> <p>4.5 NASAC to adopt and budget for French as a second working language for its activities.</p>
<p>5. Promote a scientific culture among policy and decision makers.</p>	<p>5.1 NASAC to identify strategies to sensitise/lobby governments to inculcate a culture of science, e.g. through Member of Parliament–Scientist pairing schemes and developing innovative multidisciplinary science curricula.</p> <p>5.2 NASAC to provide a broader working definition of the term ‘science’. Bring on board prominent and eminent persons, e.g. past presidents to act as champions so as to influence science policy and to attract additional financial resources.</p>

III. Strategic Planning Process

Most science academies focus on developing their statutes or constitutions as a first priority. It is also important that the academies develop strategic plans. NASAC should assist existing and new academies to embark on strategic planning processes.

It is acknowledged that strategic planning processes are varied and diverse, and therefore the academies can adopt any number of approaches. To facilitate this process, the EG recommends that academies should develop strategic plans that contain the following elements:

1. Vision and mission
2. Core values
3. Objectives
4. Strategies (short, medium and long-term)
5. Action plan (or activities)
6. Budget
7. Resource mobilisation strategies for example through:
 - membership subscriptions;
 - sale of publications;
 - commissioned studies or research;
 - establishment of an endowment fund;
 - national budget allocations or subventions; and
 - donor funding.
8. Monitoring and evaluation plan.

The Strategic Plan template should provide examples of strategic plans of successful academies as an appendix.

When embarking on the strategic planning process, NASAC encourages academies to:

1. Identify core groups of individuals to drive the process;
2. Ensure an executive structure is in place first via the academy's constitution/statutes;
3. Consider engaging a consultant to de-personalise the process and eliminate biases and interests of members.
4. Provide timeframes and deadlines for when actions/activities in the strategic plans should be executed;
5. Address the issue of ownership and originality through intensive consultation among and with members and stakeholders; and
6. Encourage the culture of success and performance in the implementation of strategic plans. This would help the academies to attract subsequent funding opportunities while maintaining good advocacy for government financial support.

Strategic plans should be 'living' and dynamic documents within the academies. Hence emphasis on their implementation cannot be overstated. To assist with the implementation process, EG recommends that NASAC encourages and supports academies to:

1. Develop implementation capacities through creation of secretariats with key professional staff on full time basis. Secretariats should also have the necessary infrastructure and in-kind support may be solicited from institutions such as local universities, research institutions or relevant ministries;
2. Create a monitoring, evaluation and implementation sub-committee;
3. Undertake periodic evaluation of the implementation process and report findings to the Executive, membership and relevant stakeholders;
4. Strengthen resource mobilisation strategies to implement the activities in the strategic plans; and
5. Develop annual work-plans and work-budgets that identify resource flows and match them with identified activities.

NASAC secretariat will provide oversight on how the academies develop and implement their strategic plans. This role will be carried out through:

- Monitoring and interaction with the academies to get periodic reports on their activities;
- Measuring impact of NASAC activities and highlighting funding opportunities for the development of the academies; and
- Linking the academies' strategic plans to existing NASAC programmes.

ACADEMIES OF SCIENCE

History, Organisational Features, Activities

1. Introduction

1.1 Academies of Science: Description and History

What is an Academy of Sciences? Definitions vary widely. In the modern sense of the term it refers to an assembly of intellectuals or fellowship of scientists dedicated to the advancement of scientific knowledge within their societies and on a global scale. Indeed, no single definition fits the description of science academies around the world since each academy has its own peculiar features. In spite of the many peculiarities related to organisational structure, budget, membership and the range of disciplines, a common feature of all the world's science academies is to seek nationwide economic and social advancements through wise applications of science and technology.

The origins of the oldest science academies of the western world lie in old academic centres that provide a forum for a society of scientists and/or thinkers curious about nature and natural phenomena. On the other hand, the Arab word *majma*, meaning assembly or an academy dates back to the 7th century. For example, Al-Ghazali's Nizamiyah Academy in Baghdad, catering to all fields of knowledge, including science, was one of the world's most renowned seats of learning at the turn of the first millennium, i.e. some 400 years before the creation of the first science academy. The first science academy in the west dates back to the first half of the 17th century. Accademia Nazionale dei Lincei of Italy, founded in 1603, was the oldest science academy to be followed by the Royal Society of London of England which was founded in 1660. Shortly after the French counterpart l'Académie Royale des Sciences was established in 1666 in Paris. At the turn of the 17th century and later in the first half of the 18th century two more science academies materialised in Berlin and Stockholm. Die Konigliche Preussische Akademie der Wissenschaften of Germany was founded in 1700 and the Royal Swedish Academy of Sciences in 1739. Science academies in Asia and Africa are relatively younger. The oldest academy in Asia, Academia Sinica of Chinese Taipei/Taiwan, was founded in 1928. Its counterpart in Africa is Madagascar's National Academy of Arts, Letters and Science (originally the National Malagasy Academy) which was created in 1902 when the country was under French colonial rule. The 20th and the beginning of the 21st centuries saw the birth of many national science academies particularly in Africa and Asia. The advances in science and technology and the recognition that science and technology play a pivotal role in improving the social and economic life of nations, led to the establishment of many of the national science academies worldwide.

1.2 Mission and Goals of an Academy of Sciences

Today's science academies have a critical role to play as a strong public voice for the promotion of both scientific excellence and science-based development. Science academies, in fact, shoulder primary responsibility in demonstrating that a strong scientific community strengthens communities throughout nations by enabling citizens to address critical economic, environmental and social issues in systematic and effective ways. Thus, the prime mission of an Academy of Sciences is to empower curiosity, discovery and innovation by stimulating interest in the sciences and technology, promoting and supporting research, improving science education, disseminating scientific knowledge and recognising and publicising high achievement in attaining these objectives.

Academies of Science come in many different shapes and sizes. Nonetheless, all academies share the same set of goals—honouring and rewarding scientific excellence, promoting the advancement of science, increasing public awareness of the value of science, and providing advice to governments on science-related issues. Despite these common goals specific objectives of individual national science academies could differ owing to the academy's capacity, focus area and budget in the respective country.

1.3 Archetypes of Academies

Each and every academy of the over 100 academies worldwide is unique. However, an analysis of their role and functions shows that essentially there are three archetypes.

Learned Society

The Learned Society is essentially an association of scientists for science, usually for a limited set of disciplines. Its most important function is to act as honorific association extending recognition to eminent scientists by inducting them into the Academy's membership. It also acts in support of science and scientists and it often is engaged in the publication of scientific publications. Overall, the interest-horizon of the Learned Society is essentially limited to science. Therefore, the leadership of a Learned Society is in the hands of scientists. There usually is a small administrative staff and the financial resources are quite limited.

Advisor to Society

Like the Learned Society, the Advisor to Society is a honorific association of scientists for science. However, it has a broader ambition: Not just to serve science, but also to serve society at large. Accordingly, the Advisor to Society has an advisory role vis-à-vis the government and the general public. Usually, this role has two sides: policies for science and science for policies. Accordingly, the interest-horizon of an Advisor to Society is not limited to science, but it also extends to societal issues. Leadership is in the hands of scientists, but there is a (much) larger number of staff, while the financial resources are (much) larger.

Manager of Research

The third archetype—Manager of Research—is an honorific association as well, while it usually also acts as Advisor to the Government. The additional element is that a Manager of Research actually manages and operates a number of research institutes, usually on behalf of the government. As a result, the Manager of Research is a much bigger organisation than the other two archetypes, sometimes employing many thousands of scientists and other staff. Leadership is therefore a much more complex arrangement, often involving several layers of authority. The Manager of Research usually has a large number of staff and extensive financial resources.

It follows from these brief descriptions that the three archetypes are not mutually exclusive. Rather, the Manager of Research builds on the Advisor to Society, just like the Advisor to Society builds on the Learned Society.

2. General Organisational Features of an Academy of Sciences

2.1 Membership

One of the most important organisational features of academies all over the world is the rules attached with membership. Membership into the Academy generally requires eminence in one's area of science. Moreover, members of an Academy can be assigned to any one of several membership categories, the most common ones being the categories referred to as Founding Member and Active Member. The former includes those who established the Academy and are outstanding scholars/scientists while the latter are elected into the Academy from different fields of science by virtue of their professional qualities. Active Members are the core of the Academy. Their qualities determine the viability and credibility of the Academy as a whole. Hence, they must be eminent scientists/scholars in the light of internationally accepted standards. In addition to these membership categories, an Academy can have Foreign Members and Honorary Members. Having Foreign Members enables an Academy to offer membership to scientists/scholars from other countries who have made real contributions to science/scholarship in the country of the Academy or to scientists/scholars born in the country but now working abroad. Honorary membership is given to individuals who have helped the Academy in the past – and may do so again in the future.

Membership categories and criteria for membership, however, may vary among academies. For example, the Royal Swedish Academy of Sciences has two membership categories namely, 'working members' (founding and elected members) and 'patrons' (honorary members). The Ugandan National Academy of Sciences (UNAS) has four membership categories (ordinary, associate, affiliate and fellow) while Mexican Academy of Sciences has two membership categories (corresponding and regular membership). Another feature associated with membership is the age limit attached to members in a given category of membership and the total number of academy members. In most academies new members are nominated into the Academy when a member turns 65 (as in the Royal Swedish Academy of Sciences). The vast disparity among academies with regard to total membership is evident. For example, the Royal Society (UK) has 1300 members, the Royal Swedish Society 364, the Nigerian Academy of Sciences 97, and the Cameroon Academy of Sciences 45.

In some academies, total membership is restricted and nominations of new members are made when old ones are retiring. In general, the issues associated with membership are perhaps the single most important (legal) factor in determining the (future) viability and credibility of an academy, both nationally and internationally. Accordingly, they need very careful consideration.

2.2 Academy Organs

A second organisational feature of academies is the governance bodies within the academy which are responsible for both internal and external activities of the academy. Organisational structure of academic organs (governance bodies) within academies may vary depending on the size of the academy, i.e. total number of academy members.

An academy with a total membership of 100–500 can have a structure with: (a) a general meeting (General Assembly) of all members that sets the general policies of the academy, (b) a smaller governing board (Board of Officers) of elected members that is charged with day-to-day management; and (c) a bureau with professional staff to support the elected officials of the academy. In a much larger academy total membership will most likely be split up in sections, each with a governance structure of its own – which implies that the overall structure outlined above no longer fits for the academy of that size. In a smaller academy the general meeting can make detailed policy decisions itself and charge one or two members with day-to-day operations.

For example, the structure of the Kenya National Academy of Sciences (KNAS) comprises the Patron, an Annual General Meeting (AGM) governing the Academy through the Governing Council (all office bearers of Academy, four members elected at the AGM of the Academy and the Secretary of the National Council of Science and Technology) and overseen by Trustees and an External Auditor. The Turkish Academy of Sciences (TAS) with a total membership of 119, on the other hand, is composed of the following organs: General Assembly of the Academy (comprising the Academy members, which convenes at least once a year), Academy Council (composed of the President of the Academy and ten principal members elected for four years) and Academy President.

2.3 Finance and Independence

Most science academies are independent, non-profit organisations and depend on some sort of budgetary support from the government or donations from private enterprises. The financial support from the government is essential particularly for young academies. Science academies in Sweden, England, Malaysia, Hungary, Turkey, and Brazil, to mention a few, receive an annual grant from their governments. Other sources of finance include grants, donations, gifts, bequests, trust funds and prizes from national or international entities, public or private, or from individuals, as well as fees from academy members or for any services it may render.

Academies can also rely on endowment funds established by their respective governments. For example, the Academy of Sciences Malaysia was launched in 1994 with a US\$ 5 million endowment fund established by the Malaysian parliament. Interest from the fund has provided the Academy with sufficient funds to cover operational and core programmatic costs. The endowment fund has not only ensured the academy's survival but has allowed it to escape the vagaries inherent in the government's annual budgetary process. At the same time, it has allowed the Academy a degree of independence to examine science and technology issues in ways that both enhance the Academy's prestige and the usefulness of its published reports for decision-makers.

Some academies, like the Royal Society of London or the Royal Swedish Academy of Sciences, own income generating institutions like Natural History Museums which make them financially better off than those in the developing countries (e.g. Uganda). Another issue in institutional structure is related to autonomy and independence of the academies. Some of the most successful academies in the developing world—for example, in Brazil and Malaysia—owe their success to strong and sustained financial

support from the government matched by the government's willingness to detach itself from influencing Academy affairs. Such a strategy has allowed these academies to enjoy both adequate levels of funding and independence. Academies prosper in such an open environment while governments benefit from the objective and unbiased advice that they receive from expert institutions that they have decided to fund but not control.

3. Academies of Science Around the World

There exists more than one hundred merit-based science academies worldwide. Details of a few of those academies are highlighted below for purposes of reference only.

3.1 The Royal Society of London

The origins of the Royal Society lie in a small group of natural philosophers who met periodically in the mid 1640s in London and Oxford to discuss scientific subjects and the ideas of Francis Bacon. Its official foundation date is 28 November 1660, when 12 of them met at Gresham College. Founders and early members of the Royal Society included the scientist Bishop John Wilkins, the philosopher Joseph Glanvill, the mathematician John Wallis, the inventor and microscopist Robert Hooke, and the architect Christopher Wren, who wrote the preamble to its charter. The Royal Society first appeared in print in 1661, and in the second Royal Charter of 1663 the Society was referred to as 'The Royal Society of London for Improving Natural Knowledge'.

Members of the society are known as Fellows. Candidates for membership in the Royal Society must be recommended by several Fellows who personally attest to the candidate's scientific achievement. The society also has a number of Foreign Members. Currently, membership in the Royal Society includes more than 1300 Fellows and 90 Foreign Members and the Society represents the British scientific community within Britain and in relations with individuals and groups of scientists throughout the world. From the beginning, Fellows of the Society had to be elected, although the criteria for election were vague and the vast majority of the Fellowship were not professional scientists. In 1731 a new rule established that each candidate for election had to be proposed in writing and this written certificate signed by those who supported his/her candidature. A mixture among the Fellowship of working scientists and wealthy amateurs who might become their patrons was maintained in the subsequent years. This view grew less popular in the first half of the 19th century and in 1847 the Society decided that in future Fellows would be elected solely on the merit of their scientific work.

This new professional approach meant that the Society was no longer just a learned society but also a de facto academy of scientists. The Government recognised this in 1850 by giving a grant to the Society of £ 1,000 to assist scientists in their research and to buy equipment. Therefore, a Government grant system was established and a close relationship began, which nonetheless still allowed the Society to maintain its autonomy, essential for scientific research.

Currently, the Society is a registered charity and has an endowment from which it runs much of its work. It also receives an annual parliamentary grant-in-aid to support specific activities. It publishes five internationally respected peer-reviewed journals, including *Philosophical Transactions of The Royal Society*, the world's oldest scientific

publication, which first appeared in 1665. The Society also confers awards (in the form of medals) to individuals whose scientific contribution is considered extraordinary. Five medals (the Copley Medal, two Royal Medals, the Davy and the Hughes) are awarded by the society every year; the Rumford and the Darwin medals biennially, the Sylvester triennially, and the Buchanan quintennially. The Copley Medal originated in a bequest by Sir Godfrey Copley (1709) and is the most prestigious scientific award in Great Britain. The Royal Society continues to publish scientific papers in its *Philosophical Transactions*, while abstracts of the papers appear in the *Proceedings*.

3.2 The Royal Swedish Academy of Sciences

Founded in 1739, the Royal Swedish Academy of Sciences is one of the oldest academies in Europe. The origin of the academy is rooted into a small scientific society at Uppsala University, known as Collegium Curiosorum, formed in 1710–1711. The Academy came into being during a period of economic ruin in Sweden and its formation is part of the many efforts that were made to remedy the situation. The politicians of the time were pursuing mercantilist policies that include the increasing of exports and reducing imports. Modern science was viewed as an important factor in this process, whether in finding new useful plants or in starting industrial manufacturing. The time was ripe for an academy of science geared towards solving the country's problem by harnessing science to economic utility. The practical and economic view of the purpose of science therefore united six scientists and politicians who met at the Palace of the Nobility in Stockholm on 2 June 1739 to form the new Science Academy. The Academy's founding members came from a range of professions: a renowned botanist, an engineer, a factory owner, and three politicians one of whom was also an amateur botanist. At the outset, the objectives of the Academy were the promotion and spread of all useful branches of science in Sweden and the application of science in solving practical problems and improving the life of the people.

The Swedes' immediate organisational model was the Royal Society of London. They wanted the Academy to have independent status and to decide for itself the form its activities would take. The Academy has a President, a Secretary, Vice-Secretary and members assigned to different sections. Membership to the Academy traditionally favoured two distinct groups – aristocrats and bureaucrats and university professors although priests, doctors and officers were all represented. Persons of power and influence were often elected solely for the benefit that this might bring to the Academy. The number of elected members was about 100 throughout the 18th century and this number was maintained with some flexibility. Members can be roughly grouped into two: 'working members' and 'patrons or honorary members', the former, which includes the founding members and elected ones. Election to the Academy requires outstanding contribution in the fields of science. Today the Academy has 164 members less than 65 years old and nearly 200 aged 65 or older, making the total number of members 364. The first of these numbers is fixed; it is not until a member turns 65 that a new member can be elected. The Academy also has 164 foreign members for whom there are no age-related rules.

The Academy's focus area in science has been changing since its establishment. The current classification of disciplines has 10 different sections where individual members are assigned:

- (1) Mathematics
- (2) Astronomy and space sciences
- (3) Physics
- (4) Chemistry
- (5) Earth sciences
- (6) Biological sciences
- (7) Medical sciences
- (8) Technical sciences
- (9) Economic and social sciences
- (10) Humanities and other sciences and outstanding services to science.

Activities of the Academy were initially of three different kinds: meetings, public lectures and the publication of Proceedings. To these was added the Academy's own programme of research, primarily in astronomy and then expanded to several fields. At present the Academy is responsible for more than seven research institutes, publishes seven scientific journals, coordinates several national scientific initiatives, and organises the work of about 20 national committees, responsible for awarding a number of prizes of which the Nobel Prize is one. Internationally, the Academy is well represented in committees and research exchange programmes.

The Royal Swedish Academy of Sciences has shown dynamism in its organisational structure (statutes and programme of work) over the centuries. The dynamism is a reflection of the Academy's organisational flexibility to adapt its mission to changing national policy and economics.

The Academy enjoys financial support from various sources including an annual grant from the Swedish Parliament. Donations from individuals, foundations (e.g. Alfred Nobel Foundation) and income generated from publications are additional sources of finance. The Academy has been in the forefront in advancing science and technology in Sweden and contributed enormously in building science-oriented society in Sweden. Some of the outstanding achievements of the Academy include a strong advocacy, awareness creation and lobbying on the need for environmental protection; the creation of Sweden's national parks; and the establishment and management of the Natural History Museum.

3.3 Academy of Sciences Malaysia

Academy of Sciences Malaysia (ASM) is one of the youngest academies in the world. In the early eighties, the first attempt was made to establish the Academy of Science Malaysia by the government's Science Advisor and the President of the Malaysia Science Association. The initiative was unfortunately not supported by Government and was unsuccessful. Nevertheless, a recommendation to establish the Academy of Science Malaysia was included in the first National Science and Technology Policy, 1986. In the succeeding 10 years, efforts continued among a small circle of academicians to come up with a proposal on the organisational make up of the Academy and win the support of the government. It was agreed that the Academy should serve first and foremost national development objectives. As such, it must have Government approval and support so that it becomes an accepted part of the Science Advice system of Malaysia. Finally, ASM was legally established under the Academy of Sciences Malaysia

Act 1994 that came into force on 1st February 1995 and was then inaugurated on 8th September 1995.

ASM's mission as stated in the Act is "the pursuit, encouragement and enhancement of excellence in the field of science, engineering and technology for the development of the nation and the benefit of mankind". It emphasises national development as ASM's prime mission. National development in a developing country has a large engineering, infrastructural and industrial development content. It is most important that engineers, architects, surveyors and town planners, and technologists in industries are involved in ASM as much as scientists. Thus, ASM membership is classified under 7 disciplines: Medical Sciences, Engineering Sciences, Biological Sciences, Mathematics and Physical Sciences, Chemical Sciences, Information Technology, and Science and Technology Development and Industry.

Membership nominations were first obtained from all the science, engineering and technological institutions and societies. The Act provides for the appointment of Honorary Fellows and Senior Fellows, the latter being appointed from amongst ASM Fellows for outstanding contribution to Science, Engineering and Technology (SET) in Malaysia and to the Academy. A Senior Fellow is entitled to be designated 'Academician' and receives a life-long annual allowance from the Government. Currently ASM membership comprises one Honorary Fellow, and 104 Fellows, of which six are Senior Fellows. New Fellows are elected at the Annual General Meeting by two-third affirmative votes of Fellows present, after being nominated by Fellows and being subject to peer review first within the discipline and then the ASM Membership Committee. ASM is governed by a Council of 16 Fellows. The administration is run by full time staff of about twelve, headed by the Executive Director.

Amongst the most important functions of ASM listed in the Act are: to provide advice to government on aspects of science and technology that are important for national development, to foster and promote the development of science and technology in Malaysia, to promote national awareness, understanding and appreciation of the role of science and technology in human progress, to promote the application of science and technology in Malaysian industries, and to establish and maintain relations with overseas bodies having the same objectives in science and technology as ASM.

In line with the above priority functions, the following five major areas of focus have guided the activities of ASM to date: advice to Government, fostering a culture of excellence in science and technology, upgrading science and technology in industry, promoting public awareness in science and technology, and enhancing international linkages in science and technology. ASM activities are carried out by working committees. Working committees draw their members from ASM Fellows and from the science and technology base of the nation.

ASM has been very active nationally. Without doubt, it has achieved the standing as the top science and technology 'think-tank' in Malaysia. ASM carried out consultancy study for the government of Malaysia on Reviewing the National Science and Technology Policy, coming up with a number of recommendations to the government on policy issues related to national science education standards, agricultural development, national

research priority areas, and integrated sustainable natural resources management schemes. ASM has become a strategic partner of the Ministry of Education in science education. Activities include biennial national science education conference and exhibition, producing publications on science and technology, organising many science and technology conferences, seminars and workshops, and awarding prizes.

3.4 Mexican Academy of Sciences

The Mexican Academy of Sciences (Academia Mexicana de Ciencias- AMC) is a non-profit organisation comprising over 1800 distinguished Mexican scientists, attached to various institutions in the country, as well as a number of eminent foreign colleagues, including various Nobel Prize winners. Through its programmes, the Academia undertakes its commitment to disseminating the knowledge and values of science, fostering improvements in the quality of education and raising the profile of science in the various spheres of national life.

The Academia's mission is to maintain its independent status; to serve as a spokesman for the scientific community with society and the Mexican state; to advocate quality, professionalism and honesty in scientific research, training and dissemination; to foster the development and consolidation of the Mexican scientific community and to ensure that the aim of the production, implementation and dissemination of scientific knowledge is always to develop the creative and intellectual capacities of individuals and society.

In fulfilling its mission the Academia has the following major objectives: to group together the most outstanding researchers in Mexico in the various areas of science and to promote public recognition of their work; to encourage scientific research, training and dissemination in Mexico; to advocate the fullest utilisation of Mexican researchers' production; to seek national and international recognition of Mexican scientists; and to promote and direct exchange with scientific organisations and communities in other countries.

Academia has several committees responsible for specific activities. There are standing committees for membership and awards. Every two years, half of the Membership Commission's members, who have held the post for four years, are replaced by new members, elected by members' vote. In the case of Awards Commission, half the Commission's members, who have held the post for two years, are replaced by new members elected by members' vote every year. It has special committees for issues of national importance. These committees engage in studies that utilise the academics' specialised knowledge and the multidisciplinary nature of the Academia to analyse the state-of-the-art of various issues, by comparing the national situation with that of other countries as well as making recommendations to help government authorities in their decision-making.

Membership to the AMC requires formal application to a standing membership commission of the Academy. Membership categories are either corresponding members or regular members. The Membership Commission, led by the Vice-President of AMC, is composed of ten researchers from the areas of exact, natural and social sciences, each of whom occupies the post for four years. Every year, the Commission analyses all candidates seeking election as regular or corresponding members. Any scientist who

has published at least 10 articles in peer-reviewed international journals is eligible for election into the Mexican Academy of Sciences; a member may also be expelled if he or she has not published an article for three years.

Since its inception, the AMC has enjoyed the financial support of various public and private institutions that have generously contributed to its activities. These include the National Council of Science and Technology, the Ministry of Public Education and the National Autonomous University of Mexico, among other institutions which have enabled the AMC to consolidate several programmes, create others and support many of the activities involved in the country's scientific work.

AMC's activities are oriented towards developing and consolidating scientific culture by strengthening the values of creative intellect so that society regards them as its own. As a result of the above, several AMC programmes are designed to promote science among young people, foster the training of new researchers, enhance communication and collaboration with institutions responsible for research in Mexico and raise the AMC's international profile. The AMC has created several programmes for promoting science to stimulate interest in scientific disciplines among Mexican children and youth. The AMC has an Awards Commission that analyses and determines the recipients of the various awards granted annually by AMC. The commission is led by the Vice-President of AMC and is divided into five areas: Exact Sciences, Social Sciences, Humanities, Natural Sciences, and Engineering and Technology.

AMC maintains crucial links with various government organisations, by actively participating in the discussion, evaluation and organisation of major national forums. To reinforce research efforts among AMC members as well as to remain in contact with international organisations, the AMC coordinates various exchange and research support programmes by maintaining solid links with similar international associations.

3.5 Brazilian Academy of Sciences

The Brazilian Academy of Sciences (BAS) was founded on 3 May 1916 under the name of the Brazilian Society of Sciences as a private association that is not-for-profit, with headquarters and jurisdiction in the city of Rio de Janeiro. The aim of BAS is to contribute to the development of science and technology, education and social welfare of the Brazil.

In fulfilling its mandate, the Academy holds scientific sessions, seminars and meetings, fosters partnerships for project implementation, and undertakes scientific exchanges with public or private, national, international organizations that have mutual interests. The sessions are dedicated to the recruiting new members of the Academy, the commemoration of important scientific events and achievement in honor of prominent scientists. The Academy acts in the following specialised areas of knowledge: (a) Mathematical Sciences; (b) Physical Sciences; (c) Chemical Sciences; (d) Earth Sciences; (e) Biological Sciences; (f) Biomedical Sciences; (g) Health Sciences; (h) Agricultural Sciences; (i) Engineering Sciences; and (j) Social Sciences.

To facilitate the development of its activities, BAS is organised in decentralised units, which work by express delegation of authority from the Board. The units are established

in various regions of the country as follows: (a) North; (b) Northeast and Espirito Santo; (c) Ontario and Midwest; (d) Rio de Janeiro; (e) Sao Paulo; and (f) South.

The membership of BAS constitutes the following categories:

- **Full Members**, who are Brazilian native and naturalised, and foreigners living in Brazil for more than 10 (ten) years, with outstanding work in science.
- The foreign researchers are **Corresponding Members** of recognised scientific merit, which has provided significant cooperation to the development of science in Brazil.
- **Member Contributors** are individuals who have rendered outstanding services to the Academy or to the national scientific development.
- **Affiliate Members** are young promising researchers, rooted in various scientific areas and chosen by Full Members with operations in the same regions. The Board appoints the Affiliate members not exceeding five (5) members per region per year. Affiliate Members are entitled to participate in the activities of the Academy for a period of five (5) years, non renewable.
- BAS, by decision of the Board, may grant the title of **Associate Member Institution** to corporations interested in the development of science and technology, who are willing to contribute financially to the implementation of activities of mutual interest.

3.6 Ghana Academy of Arts and Sciences

The proposal to establish the Ghana Academy of Learning, as the Academy was initially called, was put forward by the late Dr Nkrumah, then Prime Minister of Ghana, towards the end of 1959. A small working party was set up to consider possible members, and on the basis of its recommendations 20 persons were selected as foundation members of the Academy with the Prime Minister as its Chairman. On Friday 27 November 1959 the Academy was formally inaugurated.

On the second anniversary of the Academy in November 1961 the Academy's name was changed from the Ghana Academy of Learning to the Ghana Academy of Sciences. However, since there was a general feeling that the original name tended to convey the mistaken impression that the Academy was only concerned with the abstract pursuit of knowledge, the designation of members was changed to that of Fellows. At the time of the establishment of the Academy there was already in existence in the country a National Research Council which was responsible for research of an applied nature related to national development. Eventually in January 1963, after the matter had been considered very carefully by the Academy and the Government, it was decided that the Academy should absorb the National Research Council. The merger of the Academy and the National Research Council led to a dramatic transformation in the Academy's role and in its general image in the country.

However, the change in government in 1966 led to a reappraisal of the Academy's role. An expert committee was appointed by the new government to review the role and structure of the Academy. Based on the recommendation of the committee, the Academy was split into: (a) an Academy of Art and Sciences operating as a purely learned society, and (b) a Council for Scientific and Industrial Research concerned with

research of an applied nature related to national needs. The addition of the word 'Arts' to the new name of the Academy is significant; it was intended to underline that the Academy was concerned not only with the sciences but also with the humanities and the fine arts. Currently, the Academy's objectives include promoting the study and the extension and dissemination of knowledge of all the sciences and of learning; establish and maintain proper standards of endeavour in all fields of science and learning in Ghana; and recognise outstanding contributions to the advancement of sciences and learning in Ghana. The Academy today is thus strictly a learned society and performs exactly the same functions as those initially assigned to it at its establishment in 1959.

The affairs of the Academy are conducted principally by two main bodies: the Council, which is the governing body, and the General Meeting of Fellows, which is entitled under the constitution to receive information about all decisions of the Council and is also the final body for determining who shall be Fellows of the Academy. The Council is made up of the principal officers of the Academy namely, the President, the two Vice-Presidents who are respectively the Chairmen of the Science and Arts sections, the Secretary and the Treasurer together with six other persons elected by the General Meeting of Fellows from among the Fellows of the Academy. The term of office of all members of the Council is two years, subject to re-election for an unspecified number of times, except for the President who is not allowed to hold office for more than two successive terms. The Council is required to meet at least four times a year, while General Meetings are held at least twice a year. Apart from these two bodies the Academy also has sections representing distinct fields of knowledge. By convention the chairmen of the sections, who are elected by the members, are automatically appointed Vice-Presidents of the Academy. At present there are two sections: sciences and arts.

The more specialised work of the Academy is done by a number of committees appointed by the Council. The committees include Finance, Budget and Development, Programmes and Anniversary Celebrations, Prizes and Awards, Publications, Building, Documents, Cultural and Historical Heritage, and Scientific Committee on Problems of the Environment. The day-to-day administration of the Academy's affairs is handled by a secretariat of full-time staff consisting of administrative and secretarial and clerical staff, all of whom work under the general direction of the Honorary Secretary. The Academy is financed from membership fees, annual contributions and annual subsidies from the government.

With the exception of the Foundation Fellows, who were nominated, all Fellows of the Academy have to be elected in accordance with the procedure laid down in the Executive Instrument of Establishment. Briefly, this requires every candidate for election to be proposed by means of a certificate signed by four Fellows, one of whom must sign as the proposer and another as the seconder. The certificate, which is expected to give full details about the candidate's achievements and contributions in his chosen field of knowledge, is then considered by the Council which decides whether or not to recommend the candidate for consideration by the General Meeting of Fellows. If the General Meeting votes in favour of the candidate by the prescribed majority then he is duly elected and is admitted as a Fellow upon payment of a membership fee.

Apart from Fellows, there is provision for the election by the Council of eminent persons in the Arts or Sciences who are not Ghanaians as Honorary Fellows. Associate

membership was tenable for not more than seven years and lapsed automatically at the end of that period unless the person concerned was elected to full membership of the Academy within that period, in which case he ceased to be an Associate immediately. It was found, however, that this category of membership did not enjoy a wide appeal and it was consequently abandoned when the Academy's new Instrument was drawn up in 1963.

By its constitution the Academy is expected to disseminate and extend knowledge of the arts and sciences. This mandate is discharged through the organisation of lectures, symposia and conferences, etc. throughout the year in various parts of the country, especially Accra. The two dominant activities, however, are the J.B. Danquah Memorial Lectures and the Anniversary Celebrations which take place every year respectively in the months of February and November. These lectures were instituted in 1968 in memory of Dr J.B. Danquah, a foundation Fellow of the Academy and one of Ghana's most outstanding intellectuals and patriots who died tragically in prison in 1965 while in detention under the Nkrumah government. The lectures, which consist of a series of three, are delivered either by a Fellow of the Academy or by a distinguished scholar from outside. It is customary for each series of lectures to be published in booklet form by the Academy. The celebrations take the form of a presidential address delivered by the President, a series of symposia involving Fellows and non-Fellows, and the anniversary lecture, which is the climax of the celebrations. The anniversary lecture is normally delivered by a Fellow.

The Academy awards a number of prizes every year. The adjudication of work and materials for the award of prizes is done by the Prizes and Awards Committee with the assistance of expert assessors from within or outside the Academy. The very first prizes to be instituted were the Prince Philip gold and silver medals, which were offered by the Prince at the inauguration of the Academy. The gold medal was to be awarded for distinguished contributions to knowledge by a Ghanaian while the silver medal was to be awarded for most promising work in Science by a student of the University of Ghana, Legon, or the University of Science and Technology, Kumasi. It was decided in 1976 to replace the Prince Philip awards with the Academy's own awards for the same attainments; and to include the University of Cape Coast among the eligible university institutions. Another recent decision is that the silver medal can now be awarded for work in Arts as well. Other prizes and awards offered by the Academy are the Undergraduate Essay Prizes in Arts and Sciences and the Ghanaian Languages Prizes.

There is provision in the Academy's constitution for learned and professional societies which so desire to become affiliated to the Academy. Affiliation qualifies the societies concerned for the receipt of subventions and other forms of assistance (mostly for the publication of their journals and the organisation of conferences) from the Academy. They are also entitled to receive copies of the Academy's publications free of charge and to call on it for expert advice in connection with their academic activities. Societies requesting affiliation must fulfill certain conditions regarding their aims and objects, their membership, their publications and the kinds of activities in which they are engaged. At present the following societies are affiliated to the Academy: The Ghana Institute of Architects, The Ghana Sociological Association, The Ghana Medical Association, The Historical Society of Ghana, The Ghana Institution of Engineers, The Ghana Theological Association, The Ghana Geographical Association, The Economic Society of Ghana, The Classical Association of Ghana, and The Sarbah Society (Law).

The Academy has one official publication – *The Proceedings* – which is issued once a year and contains lectures and papers delivered during the anniversary celebrations and on other important occasions in the course of the year. The J.B. Danquah Memorial Lectures also used to be published in *The Proceedings*, but since 1974 they have been published separately in booklet form. There are plans to publish many more of the lectures given under the auspices of the Academy in mimeograph form so as to speed up the publication process and make the substance of interesting and important lectures more readily available to the general public while they are of current interest. In addition to its own publications the Academy also offers general assistance to individuals and organisations for the publication of books and other material that are considered to be academically worthy of support.

3.7 Uganda National Academy of Science

The Uganda National Academy of Science (UNAS) was launched on 20th October 2000 in Kampala. UNAS is one of the youngest Academies of Science in Africa. The Academy is now fully registered with a constitution that binds its members. The objectives of UNAS include, providing an independent forum through which scientists can exchange ideas, knowledge and experiences; promoting and fostering the growth of the scientific community in Uganda; encouraging, stimulating, designing and coordinating interdisciplinary and trans-disciplinary scientific research and development; getting involved in the planning, convening and co-ordination of scientific education programmes and helping in the development and nurturing of high-level scientific and technological manpower in Uganda; and establishing a regular award scheme for recognition of outstanding achievements in science and advocating for proper, safe and ethical exploitation of science and technology in national development. Major emphasis areas are broadly grouped as physical sciences, biological sciences, and social sciences and behavioural sciences.

Several membership types are available for individuals who aspire to be a member of UNAS. Every aspiring member applies to the Chairperson of UNAS in writing, stating his/her qualifications and the membership status sought. The different categories of membership are:

- (a) **Ordinary membership** – Any scientist, who supports, promotes and subscribes to the cause and objectives of UNAS is eligible to become an ordinary member of UNAS. (Membership subscription is close to 30 USD per annum).
- (b) **Associate membership** – Is for any scientist representing another organisation, institution or body where goals and objectives are similar to those of UNAS. (Membership subscription is close to 115 USD per annum).
- (c) **Fellow** – A scientist identified and honored by UNAS for outstanding achievement(s) in science. (Membership subscription is close to 60 USD per annum.)
- (d) **Affiliate membership** – Is for any scientific or other organisation recognised as such by UNAS, supporting and subscribing to the cause and objective of UNAS. (Membership subscription is close to 580 USD per annum.)

The organisational structure of UNAS consists of the following organs:

- **The General Assembly:** The supreme body of UNAS consists of all members as defined in the UNAS constitution.

- **Executive Committee (EC):** Supervises and oversees the implementation of the vision, mission, policies and functions of UNAS. The EC oversees the running of the UNAS Secretariat and has a President, Vice-President, a Treasurer and six other members.
- **The Secretariat:** Headed by an Executive Secretary, implements UNAS' programme and is responsible for the day-to-day running of the operations of UNAS.

Some of the activities of UNAS include holding annual general meetings (AGM) once a year or a specific general meeting (SGM) should circumstances so dictate. UNAS also convenes scientific conferences at which academic papers of relevance to the socio-economic needs of Uganda are delivered and key issues pertinent there to be discussed. Other activities include inventory of researchers and research activities and strengthening the links with regional and international academies of science.

4. Scientific Organisations and Networks

4.1 Regional Academy and Network

(a) African Academy of Sciences

The African Academy of Sciences (AAS) was started in 1985 as a continent-wide, professional, non-political and non-profit organisation. It was established with the aim of developing into a pan-Africa forum to champion science-led development in Africa. The AAS was conceived on the 6th day of July 1985 when 33 prominent scientists met in Trieste, Italy, at the inauguration of the Third World Academy of Sciences (TWAS) and devised the concept of the African Academy of Sciences (AAS). Through the years membership into the academy has grown rapidly from the initial 33 members in 1985 to 107 in 1995, representing 24 African countries and 5 countries overseas. AAS has a governing council (GC) consisting of officers elected by the general assembly and who meet annually to formulate and review the programmes of the Academy; receive, examine and approve audited accounts; appoint a membership advisory committee to make recommendations for the selection of new Fellows and appoint members of the executive committee among others. The Governing Council elected in December 2005 has 12 members from different member African countries. The Academy set out its mandate to cover four principal areas: mobilisation and strengthening of the African scientific community; publication and dissemination of scientific materials; research development and public policy, and capacity building in science and technology in Africa.

(b) Network of African Science Academies (NASAC)

The Network of African Science Academies (NASAC) was established on 13th December 2001 in Nairobi, Kenya, under the auspices of the African Academy of Sciences (AAS) and the Inter Academy Panel (IAP). At that inception meeting, the NASAC statutes were drafted and signed by nine member academies: African Academy of Sciences, Cameroon Academy of Sciences, Ghana Academy of Arts and Sciences, Kenya National Academy of Sciences, Madagascar's National Academy of Arts, Letters and Sciences, Nigerian Academy of Sciences, Académie des Sciences et Techniques du Senegal, Uganda National Academy

of Sciences, and Academy of Science of South Africa. Through the years, the network has been expanding as additional national academies become part of it. These include Sudan National Academy of Sciences, Tanzania Academy of Sciences, Zambia Academy of Sciences and Zimbabwe Academy of Sciences.

The Network of African Science Academies is an independent African forum that brings together several academies of science in the continent to discuss the scientific aspects of problems of common concern, to make common statements on major issues relevant to Africa and to provide mutual support to member academies. Drawing from this overall objective, NASAC aims to specifically:

- Facilitate the provision of advice to governments and regional organisations on scientific aspects of issues of importance to Africa's development.
- Promote cooperation between academies in Africa by exchanging information on programmes and experiences and sharing common visions.
- Assist in building the capacities of academies in Africa to improve their role as independent expert advisors to governments and to strengthen their national, regional and international functions.
- Assist scientific communities in Africa to set up national independent academies where such bodies do not exist.
- Organise conferences, workshops and symposia and issue statements or reports on topics of major African concern.

In pursuing the specific objectives above, NASAC collaborates with other academies and institutions or organisations within and outside Africa to undertake initiatives or activities geared towards sustainable development in Africa. NASAC believes that science is essential to the economic, social and cultural development of Africa. Acting from this belief, NASAC activities will continually be geared towards: assisting its membership make the voice of African science heard by African and worldwide decision-makers and supporting them to contribute to science and technology capacity building in all African countries.

The NASAC network leadership structure consists of the General Assembly (overall decision making body comprised of the representative academies' presidents), an Executive Committee (the executive arm of NASAC network composed of a President, 3 Vice-Presidents and a Secretary General), the Secretariat (responsible for the formal functions and legal operations of the network), and Executive Directors from member countries. NASAC has three major programmes on science education and capacity building for African academies and research grants for scientists in member African countries.

4.2 International Academy and Networks

(a) The Academy of Sciences for the Developing World

The Academy of Sciences for the Developing World (TWAS), is an autonomous international organisation, founded in 1983 in Trieste, Italy, by a distinguished group of scientists from the South under the leadership of the late Nobel laureate Abdus Salam of Pakistan. It was officially launched by the Secretary-General of the United Nations in 1985. TWAS represents the best of science in developing countries. Its main

mission is to promote scientific excellence and capacity in the South for science-based sustainable development. The Academy's strength resides in the quality and diversity of its membership – internationally renowned scientists elected by their peers. TWAS Fellows, who represent 85 percent of the membership, are citizens of the South; TWAS Associate Fellows are citizens of the North who have made significant contributions to the advancement of science in the South. At present, TWAS has 874 members from 90 countries.

A Council, elected every three years by TWAS members, is responsible for the Academy's broad policy and programmatic directions. The Secretariat, headed by an executive director and located on the premises of the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, assists the Council in the administration and coordination of the programmes.

TWAS has the following four objectives:

- Recognise, support and promote excellence in scientific research in the developing world;
- Respond to the needs of young scientists in S&T-lagging developing countries;
- Promote South–South and South–North cooperation in science, technology and innovation;
- Encourage scientific research and sharing of experiences in solving major problems facing developing countries.

Since 1991, the United Nations Educational, Scientific and Cultural Organization (UNESCO) assumed responsibility for administering TWAS funds and personnel on the basis of an agreement signed by TWAS and UNESCO. In 2004, the Italian government passed a law that ensures a continuous financial contribution to the Academy's operation. Representatives of the Italian government and UNESCO are members of the TWAS Steering Committee, which meets annually to discuss financial matters.

In addition to its strong links with UNESCO and ICTP, TWAS provides administrative support for the Third World Organization for Women in Science (TWOWS), the Inter-Academy Panel on International Issues (IAP), the Inter-Academy Medical Panel (IAMP), and the Consortium on Science, Technology and Innovation for the South (COSTIS). The Academy also maintains close ties with academies, research councils and ministries of science and technology in developing countries.

The Academy's major activities include conferring awards and prizes for outstanding scientists from the developing world, creating opportunities for fellowships, providing research grants to Third World researchers and helping in capacity building of science institutions in the Third World.

(b) Inter-Academy Panel (IAP)

IAP is a global network of the world's science academies. Launched in 1993 its primary goal is to help member academies work together; to advise citizens and public officials on the scientific aspects of critical global issues. IAP is particularly interested in assisting young and small academies achieve these goals and, through the communication links and networks created by IAP activities, all academies will be able to raise both their public profile among citizens and their influence among policy makers. IAP has forged

partnerships among its member institutions and works closely with other scientific organisations, including the International Council for Science (ICSU), Inter-Academy Council (IAC) and Inter-Academy Medical Panel (IAMP). IAP also cooperates with regional academies, such as the Federation of Asian Scientific Academies (FASAS), All European Academies (ALLEA), Network of African Science Academies (NASAC), European Academies' Science Advisory Council (EASAC), Association of Academies of Sciences in Asia (AASA) and the Caribbean Scientific Union (CSU), all of which serve as observers of IAP activities.

(c) International Council of Scientific Unions (ICSU)

Founded in 1931 to promote international scientific activity in the different branches of science and its application for the benefit of humanity, the International Council of Scientific Unions (ICSU) is one of the oldest non-governmental organisations in the world. It is headquartered in Paris with the Government of France as its host. It represents the evolution and expansion of two earlier bodies known as the International Association of Academies (IAA; 1899–1914) and the International Research Council (IRC; 1919–1931). The International Council for Science (ICSU) represents a global membership that includes both national scientific members (114 members) and international scientific unions (29 members). In 1998, members agreed that the Council's current composition and activities would be better reflected by modifying the name to the **International Council for Science**, while its rich history and strong identity would be well served by retaining the existing acronym, ICSU.

ICSU's extensive membership network constitutes an international forum for scientific research and policy development. In broader terms, because of its representative and diverse membership, the Council is increasingly called upon to speak on behalf of the global scientific community and to act as an advisor in matters ranging from ethics to the environment.

The mission of ICSU is to strengthen international science for the benefit of society. ICSU mobilises the knowledge and resources of international science community to: identify and address major issues of importance to science and society; facilitate interaction amongst scientists across all disciplines and from all countries; promote the participation of all scientists – regardless of race, citizenship, language, political stance, or gender – in the international scientific endeavour; and provide independent, authoritative advice to stimulate constructive dialogue between the scientific community and governments, civil society and the private sector.

ICSU focuses its activities in the following areas:

- (1) Planning and coordinating interdisciplinary research to address major issues of relevance to both science and society.
- (2) Advocating freedom in the conduct of science, promoting equitable access to scientific data and information, and facilitating science education and capacity building.
- (3) Acting as a focus for the exchange of ideas, the communication of scientific information and the development of scientific standards.
- (4) ICSU also helps create international and regional networks of scientists with similar interests and maintains close working relationships with a number of intergovernmental and nongovernmental organisations.

ICSU seeks to accomplish its role in a number of ways. Over the years, it has addressed specific global issues through the creation of interdisciplinary bodies, and of joint initiatives in partnership with other organisations. Important programmes of the past include the International Geophysical Year (1957–1958) and the International Biological Programme (1964–1974). Major current programmes include the International Geosphere-Biosphere Programme: A Study of Global Change (IGBP), the World Climate Research Programme (WCRP), DIVERSITAS: An Integrated Programme of Biodiversity Science and the International Human Dimensions Programme on Global Environmental Change (IHDP).

In 1992, ICSU was invited to act as principal scientific adviser to the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro and, again in 2002, to the World Summit on Sustainable Development (WSSD) in Johannesburg. Prior to UNCED, ICSU organised an International Conference on an Agenda of Science for Environment and Development into the 21st Century (ASCEND 21) in Vienna, in 1991, and ten years later, ICSU mobilised the scientific community even more broadly by organising, with the help of other organisations, a Scientific Forum in parallel to the WSSD itself. ICSU also actively participated in the World Summit on the Information Society (WSIS) in Geneva, 2003 and Tunis, 2005.

* *An imaginary country with an equally imaginary Academy of Sciences – where Alice is in charge of all discoveries, scientific or otherwise.*

STATUTES OF THE ACADEMY OF SCIENCES OF WONDERLAND*

Ideas to Assist with the Establishment of an Academy of Sciences

* An imaginary country with an equally imaginary Academy of Sciences - where Alice is in charge of all discoveries, scientific or otherwise.

Foreword

The statutes of the 'Academy of Sciences of Wonderland' presented in this document are intended as a source of inspiration and ideas for individuals who may wish to create a new academy of sciences or engineering or medicine. They were developed for the IAP as part of a larger project to prepare a publication with the (working) title 'Organising Science Academies' on the organisational and managerial aspects of academies.

Although the statutes of about 30 real academies were reviewed to generate input for the "Wonderland Statutes", these Statutes do not represent a model proposed by IAP, nor is there any suggestion that for IAP they set a norm that should be followed. It is up to the local organisers of a new academy to decide what to take from the Statutes, what to change and what to ignore.

We are most grateful to Albert Koers for his efforts in drafting these texts. We hope, and expect, that Statutes of an imaginary academy in an imaginary country may be useful to scientists considering the question of how to establish a real academy or who are already involved in the drafting of statutes for such an academy. If necessary, the IAP stands ready to provide further assistance to these scientists.

The mission of the IAP is to help with establishing new academies and with strengthening the capacities of existing academies, particularly in developing countries. We consider the "Wonderland Statutes" part of that mission.

Yves Quéré
Co-Chair

Chen Zhu
IAP Co-Chair

Introduction

It is of course quite impossible to draft model statutes that meet the needs of each and every science academy: Each academy is unique and wants to be unique. However, the fact is that at a more abstract level there is a great deal of overlap between the issues that must be dealt with in the statutes of any science academy. All such statutes must deal with objectives, activities, membership, governance, finances, administration, etc.

The model statutes presented here aim, first, to identify those issues and, second, for each issue to present a possible arrangement to deal with it. However, for a specific academy there may be additional issues; some issues raised in the model statutes may not be relevant at all in a specific situation and for any given issue other arrangements are not only possible, but may even be preferable considering the local conditions.

- Accordingly, for each and every provision presented below, the first question should be whether or not, in the light of the local situation, it is really necessary to deal with that provision's subject matter in the statutes that are being drafted.
- If this initial question is answered in the positive, then the next question should be whether or not the text of the provision presented below meets the local needs or desires and, if not, how it should be re-drafted, in whole or in part.

Not only academies are unique, but so are the legal systems within which an academy's statutes are to function. Not all provisions suggested below need to be checked in the light of national law, but there are some for which this is necessary. Mostly, this applies to the legal status of an academy under national law, but—more practically—also to its status under local tax laws.

Input for these model statutes was sought—and found—in the statutes of a number of real academies of science. Apart from a great deal of similarity in terms of the issues addressed, as well as much variety in the arrangements to deal with them, there also is a great deal of difference between these real statutes in the level of detail. Some academies have very general statutes, while other academies have statutes that go into extreme detail.

The statutes presented below try to strike a balance: They do not aim to cover every contingency in detail, but they do try to address all likely contingencies that may occur in the normal life of an academy. For the sake of clarity it was also decided to present only a set of statutes. However, in reality it may be advisable to move some provisions to bylaws, rules of procedure or standing orders. This not only makes the statutes simple, but it also gives more flexibility when changes are needed.

Overall, the statutes that follow are intended for a medium-size academy with a total of, say, 100 to 500 members. An academy of this size can have a structure with: (a) a general meeting of all members that sets the general policies of the academy, (b) a smaller governing board of elected members that is charged with day-to-day management; and (c) a bureau with professional staff to support the elected officials of the academy.

- In a much larger academy total membership will most likely be split up in sections, each with a governance structure of its own—which implies that the overall structure outlined in the preceding paragraph no longer fits for an academy of that size.

- In a smaller academy the general meeting can make detailed policy decision itself and charge one or two members with day-to-day operations. Clearly, for such a small academy a much simpler subset of the model statutes would suffice.

The importance of statutes should not be underestimated, nor should it be overestimated. The quality of the individuals involved—elected officials and staff—and of the organisation as a whole, is much more important. When an academy is governed by wise men and women, statutes will most likely live out their lives on the bottom of a drawer. And if an academy's leadership is incompetent, no statutes can really remedy that situation. But good statutes—like good laws—may help the wise and stop the not-so-wise.

All this confirms what was said earlier by the IAP Co-Chairs: The Statutes of my imaginary “Wonderland Academy” should be seen as a source of ideas and inspiration in drafting a unique set of provisions that really meet the specific needs of the academy-to-be. The Wonderland-Statutes are a starting point for discussion – not the outcome.

Albert Koers

Statutes

- Whereas science, in all its aspects and in all its forms, enriches our understanding of the world around us and of ourselves;
- Whereas the contributions of science are essential for the advancement of our nation and its growth and development;
- Whereas the values of science and of the scientific method enhance the quality of the decision-making processes to chart the nation's future;
- We, the undersigned, have agreed to establish an academy of science¹.

¹ *Such a Preamble is of course optional, but it may be used to present, as concisely as possible, to the outside world, the reasons of the "Founding Members" to set up the Academy.*

Article 1: Establishment²

- 1.1 The Academy of Sciences of Wonderland, hereinafter referred to as the 'Academy', is an autonomous science³ organisation established by a group of scientists, hereinafter called 'Founding Members'⁴, to pursue the objectives set out below.
- 1.2 The Academy shall be concerned with the natural sciences, mathematics, medicine and other life sciences, the engineering sciences, social sciences and the humanities⁵.
- 1.3 The Academy has legal personality under the laws of Wonderland, it may receive and dispose of property, monies and other assets and it is capable of suing and being sued under its own name⁶.

² In addition to the statutes, there also may be enabling legislation, adopted by the parliament and/or government to recognise the academy and its statutes as a public organisation. However, such legislation should not impede the ability of the Academy to arrange its own affairs as this may raise questions in relation to the Academy's independence.

³ The term 'science' appears more appropriate than 'scientific' as the work of the Academy relates to science, without that work being done 'scientifically'.

⁴ If a new academy is to be credible, it is of course essential that the Founding Members themselves are eminent scientists. One or more well-established academies or the IAP—as the organisation representing all leading science academies of the world—could be engaged on an ad hoc basis to vouch for the qualifications of the Founding Members.

⁵ Here, a choice has to be made: All these disciplines or fields or just a subset? Also, in some cases it may be advisable to be more detailed, while in other cases just the opposite may be true. Lastly, is it desirable to mention explicitly that the Academy is concerned both with basic sciences and with applied sciences?

⁶ Depending on the existence and the content of enabling legislation, additional provisions may need to be added here to meet specific requirements of the law of the country in which the academy is established. There also may be certain procedures to register the organisation. A specific issue in many countries is how to ensure that for tax purposes the academy is classified as a non-profit or even as a charitable organisation.

Article 2: Objectives⁷

- 2.1 The objectives of the Academy are:
 - 2.1.1 To recognise, support and promote excellence in scientific research performed by scientists who are citizens of Wonderland⁸;
 - 2.1.2 To promote contacts among scientists who are citizens of Wonderland and between them and the world scientific community;
 - 2.1.3 To strengthen the global position and role of scientific research performed by scientists who are citizens of Wonderland;
 - 2.1.4 To advise the government on the quality of science in Wonderland, as well as on scientific aspects of social and economic issues in Wonderland⁹;
 - 2.1.5 To provide information on science to, and build support for science with, the general public in Wonderland;
 - 2.1.6 To advise the government on all issues related to science teaching and science education in the country;
 - 2.1.7 To ensure that in Wonderland research is conducted in areas or on questions of special importance to science or the nation.
- 2.2 In pursuing these objectives the Academy shall ensure the highest standards of independence and impartiality. Any recommendations or advice emanating from the Academy shall be merit-based and be made public unless exceptional circumstances make this impossible¹⁰.

⁷ Objectives should give direction and identity, but it is not advisable to make them so specific as to force the Academy into a straightjacket. However, even if the objectives remain general, important choices need to be made between three different sets of objectives: (a) those dealing with the Academy as a learned society (here the provisions 2.1.1 to 2.1.3); (b) those dealing with the Academy as an adviser to the nation and the government (here the provisions 2.1.4 to 2.1.6); and (c) those dealing with the Academy as a manager of research institutions (here the provision 2.1.7). The role of learned society is inherent to all academies, implying that objectives such as 2.1.1 to 2.1.3 should always find their way into statutes. But if, for some reason, an academy does not have, or does not wish to have, a role as adviser to the nation/government or as manager of research institutions, objectives such as set out in 2.1.4 to 2.1.7 have no place in the statutes of that academy.

⁸ There are several alternatives here: (a) not link membership to any nationality so that members may come from all countries of the world, strictly on the basis of scientific eminence; (b) to refer to “scientist working in Wonderland”, or “scientist with residence in Wonderland”, but then the terms ‘working’ or ‘residence’ should be defined more precisely. Is a two-week visit enough? And does ‘residence’ relate to a factual or to a legal status?

⁹ This phrase implies that the Academy is concerned both with “policy for science” and with “science for policy” issues. However, in a concrete situation one of these two perspectives may be less (or more) relevant than the other.

¹⁰ This provision clearly reflects an ideological position. Yet, it also articulates a core-feature of an Academy of Science if that academy is to express the values of science.

Article 3: Activities¹¹

- 3.1 In pursuing the objectives set out in article 2, the Academy may undertake, *inter alia*, the following activities¹²:
- 3.1.1 Present a platform for discussion and dialogue to all scientists from Wonderland and elsewhere on issues of common interest;
 - 3.1.2 Elect into the membership of the academy scientists who have made outstanding contributions to their respective field(s) that meet the highest internationally accepted standards;
 - 3.1.3 Represent and promote the interests of science in Wonderland in national, regional and international organisations and decision-making bodies;
 - 3.1.4 Conduct studies and publish reports and statements on themes and topics that relate to science in Wonderland or to scientific aspects of social and economic issues in Wonderland;
 - 3.1.5 Award competitive research grants to scientists who are citizens of, and to research organisations established in, Wonderland, either from its own financial resources or from financial resources made available to it;
 - 3.1.6 Award medals, prizes and other honours to scientists from Wonderland or elsewhere who have made outstanding contributions to their respective field(s) or to the objectives of the Academy;
 - 3.1.7 Publish journals, other periodicals and books, both for the community of scientists and for the public at large;
 - 3.1.8 Manage, or support the management of, scientific research institutions or departments of such institutions in Wonderland;
 - 3.1.9 Organise conferences, workshops and symposia on themes and topics that fall within its objectives and undertake such other projects and activities as it deems appropriate for achieving its objectives.
- 3.2 In carrying out these activities the Academy shall endeavour to contribute to the social and economic development of Wonderland. It shall also endeavour to increase awareness in society of the values represented by science and the scientific method¹³.
- 3.3 In carrying out these activities the Academy shall maintain effective cooperation and coordination with other organisations or institutions, national or international, that have similar objectives¹⁴.

¹¹ As with the article on objectives, the article on activities should not deny an academy the flexibility to adapt to changed conditions. Hence, the 'inter alia' in the introductory paragraph of this article and the open formulation on other activities in provision 3.1.9.

¹² Of course, not all activities need to be mentioned. However, it is important that the list of activities is consistent with the list of objectives. If, for example, provision 2.1.6 is deleted from the list of objectives, then the corresponding provision 3.1.8 on activities should also be deleted. As a rule, it should be possible to link each activity to one or more of its objectives.

¹³ This provision may not be without controversy as it also reflects an ideological position on the value and values of science.

¹⁴ This clause has been formulated here in general terms. In a specific situation it may be wise to add the most relevant organisations by name.

Article 4: Membership¹⁵

- 4.1 The membership of the Academy shall consist of the following categories:
 - 4.1.1 Founding Member¹⁶;
 - 4.1.2 Active Member¹⁷;
 - 4.1.3 Emeritus Member¹⁸;
 - 4.1.4 Foreign Member¹⁹;
 - 4.1.5 Honorary Member²⁰.
- 4.2 Active members shall be elected from amongst active scientists who are citizens of Wonderland²¹ and who have, according to internationally accepted standards, made outstanding contributions to their respective field(s) of science. Active Members enjoy all the rights and have all the obligations of membership.
- 4.3 An Active Member shall become an Emeritus Member at the end of the year in which he/she reaches the age of 70 years. Emeriti Members shall have the same rights and obligations as Active Members, except the right to be elected Officer of the Academy²².
- 4.4 Foreign Members²³ shall be elected from amongst scientists who are not citizens of Wonderland, but who have made significant contributions to science in Wonderland. Foreign Members shall meet the same criteria for membership as Active Members. Foreign Members shall have the same rights and obligations as Active Members except the right to vote in the General Meeting or to be elected Officer of the Academy²⁴.

¹⁵ *The issues associated with membership are perhaps the single most important (legal) factor in determining the (future) viability and credibility of an academy, both nationally and internationally. Accordingly, they need very careful consideration.*

¹⁶ *For mechanisms to ensure the standing of the group of Founding Members, see footnote 4. It is of course a closed group once the academy has become operational.*

¹⁷ *Active members are the core of the Academy. Their qualities determine the viability and credibility of the Academy as a whole. Hence, the requirement of provision 4.2 that they must be eminent scientists in the light of internationally accepted standards.*

¹⁸ *It is of course possible not to make a distinction between active and emeriti members, implying that all members stay in the category 'active' until their membership ends, presumably by death. However, this creates a serious risk that over the years the average age of the members increases, especially if there is a limit on total membership and/or recruitment of younger members is not very successful. The transition from Active Member to Emeritus Member can of course also be set at another age, but 70 seems a good balance.*

¹⁹ *Having Foreign Members enables an academy to offer membership to scientists from other countries who have made real contributions to science in the country of the Academy or to scientists born in the country but now working abroad.*

²⁰ *Introducing a category of 'Honorary Member' is not necessary, but it enables an academy to engage individuals who have helped the academy in the past – and may do so again in the future. This background also explains why the criteria for membership are different from those for the other categories.*

²¹ *But see the discussion of footnote 8. It is conceivable not to link membership to any nationality at all or to link it to being a resident, rather than a citizen. If membership is not linked to citizenship, the category of 'Foreign Member' should be dropped.*

²² *Here, 'only' the right to be elected Officer of the Academy is withheld from Emeriti Members, but it is of course possible to withhold more (the right to vote, for example) or less (for example, the right to become President of the Academy). However, there always should be some sort of distinction.*

²³ *But see footnotes 8 and 21, suggesting that there may be no Foreign Members.*

²⁴ *Like in footnote 22: More, but also less may be withheld from Foreign Members. However, it seems logical to differentiate in relation to the two issues mentioned so that it is clear that the Academy of Wonderland is indeed under the control of scientists from Wonderland.*

- 4.5 Honorary Members shall be elected by the General Meeting from amongst persons of eminence who have made outstanding contributions to the objectives of the Academy. Honorary Members shall have the same rights and obligations as Active Members²⁵.
- 4.6 The General Meeting may, on a proposal from the Board, divide the Academy's total membership in classes based in discipline²⁶. It may also set an upper limit to the number of members that may be elected each year into a class or, in the alternative, it may set an upper limit to the total number of members in each class²⁷.
- 4.7 Members of the academy shall uphold the statutes of the academy and they shall contribute to the achievement of the objectives of the Academy²⁸.
- 4.8 Membership ends if a member withdraws from the Academy, provided he/she has met all financial obligations to the Academy²⁹. Membership also ends when a member is convicted of a crime or other serious offence, is declared bankrupt or is declared to be of unsound mind, each of these decisions to be made by a competent court of law or other legally designated authority³⁰.
- 4.9 A member may be expelled from the Academy when that member has acted in manifest contravention of these Statutes or has otherwise prejudiced the good name or interests of the Academy. Expulsion shall be a decision of the Board, shall be a last resort and shall be based on grounds that are communicated to the member. Before taking a decision on expulsion, the Board shall give the member concerned the opportunity to defend him/herself³¹.

²⁵ *Again: Local circumstances may suggest another approach. However, assuming that there will be only a few Honorary Members and that they will be persons of the highest standing, why take away from the honour to be given to them by withholding from them at the same time any of the rights and obligations of membership?*

²⁶ *In some cases — especially for larger academies with, say, more than 300 members — it may be better if the Statutes themselves already divide membership in 'Classes' — or 'Colleges', 'Divisions' or 'Sections', etc. Indeed, in many academies this is established practice. However, for new academies it may be wise to see how membership develops before considering the creation of classes. If classes are created, either directly in the Statutes or later when membership grows, one of the consequences is that special rules and arrangements need to be introduced on the governance of these classes. Such arrangements may be minimal in nature (making a class primarily a meeting place for related disciplines), but they may also be more far-reaching (even to the point of making a class in fact a mini-academy of its own). In the latter situation, it is likely that the statutes of the academy will have to differ on essential points from the statutes presented here.*

²⁷ *First, reason that the provision requires the Board and the General Meeting to work together is that the membership provisions are of such a crucial process that both bodies must support any decision. Second, it is for each academy to decide whether or not it wishes to set an upper limit on membership. However, fact is that such a limit may make the recruitment of younger members more difficult—if not impossible—unless there are strict rules on retirement as well. An alternative to a limit on membership would be a limit on the number of new members that are accepted every year, either in total or for each class. In this respect it may also be wise for a new academy to see how membership develops before making a definitive choice.*

²⁸ *An alternative approach would be a set of detailed provisions on the rights and obligations of members—even to the point of specifying the hours during which they have access to the library—but a general provision as suggested here should suffice in most situations.*

²⁹ *Members should have the right to withdraw at all times. For example if they disagree fundamentally with a position taken by the academy. However, any financial obligations should be met.*

³⁰ *Overall, same observation as in footnote 28: These clauses appear to suffice in most situations.*

³¹ *Expulsion is a serious matter, both for the member concerned and for the Academy. It should therefore be strictly limited to a set of pre-defined conditions—here: contravention and prejudice—and there should be strict procedural guarantees against arbitrariness. In most cases a general provision like this should be sufficient.*

Article 5: Election of Members³²

- 5.1 Nominations for election into the Membership of the Academy shall be made in writing by two members of the Academy. A nomination shall be personally addressed to the President of the Academy³³.
- 5.2 Nominations for election may be submitted at all times, but nominations received less than six months prior to the next General Meeting shall not be considered at that Meeting, but at a later General Meeting³⁴.
- 5.3 A nomination shall consist of the following documents: (a) a statement of at most 50 words on the most significant contribution to science of the candidate; (b) a statement of at most 500 words giving the reasons why the candidate should meet the criteria for membership; (c) the names of five referees with the widest possible geographical distribution who may be consulted by the academy; (d) a list of what are considered the 12 most outstanding publications of the candidate; and (e) a full CV of the candidate including a list of all his/her major publications³⁵.
- 5.4 For each round of elections the President shall appoint a Membership Advisory Committee for each discipline, or group of disciplines, to assist him/her with the selection of the candidates to be proposed by him/her to the Board. The list of candidates to be submitted to the Board shall be drawn up in a meeting of the Chairpersons of the Membership Advisory Committees, chaired by the President of the Academy³⁶.
- 5.5 If there is a limit on the number of new members that can be elected, the Board shall consider not only the individual qualifications of the candidates, but also the overall balance between disciplines, age and gender in the membership of the Academy³⁷.
- 5.6 The Board shall draw up a final list of candidates to be elected into the Academy. It shall send this list to all members for a secret ballot. This ballot shall be held as follows³⁸:

³² Like article 4, this is a most crucial set of provisions for the future viability and credibility of the Academy—perhaps even more so as these provisions should make it clear to everyone that it is the Academy that elects new members solely on the basis of their contribution to science. The various provisions of this article could go in much more detail, but what is suggested here appears to cover all essential elements.

³³ Two seems a reasonable number, but a higher number is of course possible. It is suggested to send nominations personally to the President so that he/she may intervene immediately (and with a minimum of loss of face for the nominators) if a nomination is clearly out of order.

³⁴ An alternative would be to specify cut-off dates and deadlines. The advantage of this provision is that it is self-policing. Note that nominations are “considered at” the General Meeting—and not “approved by” the General Meeting. This as the election as such is done earlier by secret ballot.

³⁵ Again, the precise requirements may vary, but these elements seem to cover the essentials.

³⁶ Such Committees not only enhance the quality of the information and spread the workload over a larger number of people, but they may also act as a buffer to protect the President if, for some reason, a particular nomination becomes controversial at a later stage. The Chairpersons of the various committees receive of course all sorts of input from Committee members, but it is they and the President of the Academy that integrate all this input into a single consolidated list.

³⁷ If there is no such limit, this provision can be deleted. However, even in that case a balanced membership remains an important issue. The provision also suggests that it is the Board that should consider the overall picture, including aspects that do not relate to individual qualifications.

³⁸ The arrangements that follow are fairly typical for the election procedures of many existing academies. They are designed to make quite clear that it is the membership that decides, not through a collective raising of hands at a meeting, but through the considered decision of each individual academy member. An alternative for smaller academies could be to take the vote, also in the form of a secret ballot, at a General Meeting. The reference to a ballot by e-mail in provision 5.6.10 should need no further explanation.

- 5.6.1 If the Board has placed more candidates on the final list than there are vacancies to be filled, it shall indicate its own order of preference;
 - 5.6.2 When sending the final list to the members the Board shall include two envelopes, one marked with the name of the member, the other blank and without any markings;
 - 5.6.3 The Board shall indicate to members the deadline on which all replies from members must have been received by it;
 - 5.6.4 The member shall indicate for each candidate on the final list whether he/she supports the election of that candidate, opposes election or abstains;
 - 5.6.5 The member shall then place the final list in the unmarked envelope and place that envelope in the envelope marked with his/her name;
 - 5.6.6 The Board shall verify that all replies received come from a member of the academy and it shall then put all unmarked envelopes in a sealed ballot box;
 - 5.6.7 When the deadline has passed, the Board shall open the ballot box and count the number of members that have responded;
 - 5.6.8 If that number is less than two-thirds of all members, the Board shall declare the ballot void and initiate a new ballot for which the required number of responses shall be reduced to one-half of total membership;
 - 5.6.9 A candidate is elected when he/she receives the support of at least one-half of the members that have responded and if no more than one-fourth of the responding members oppose his/her election³⁹;
 - 5.6.10 The above arrangements may also be implemented by e-mail provided that their intent and purpose is respected.
- 5.7 The President shall present each candidate that has been elected into the Membership of the Academy to the next General Meeting and he/she shall state the grounds for election. Membership becomes effective once the candidate has stated before the General Meeting that he/she accepts all rights and obligations of membership⁴⁰.
- 5.8 All information obtained by the President, the members of the Membership Advisory Committee(s), the Members of the Board or the staff of the Academy on persons considered for election shall be treated as confidential to protect their privacy⁴¹.

³⁹ *This particular provision is designed to ensure that only candidates are elected who enjoy general support and not much opposition.*

⁴⁰ *Essentially, this provision is not about electing candidates into the Membership of the Academy, but about confirming the election results before the highest organ of the Academy: the General Meeting of all Members. For that reason, the candidate-elect also has to formally accept membership before that body, either by making a brief statement or by a solemn vow or oath.*

⁴¹ *This provision could be made much more elaborate, but it covers what needs to be said.*

Article 6: General Meeting⁴²

- 6.1 The General Meeting is the highest body of the Academy and it is composed of all members of the Academy. It shall meet at least once every year in an Ordinary Session at the offices of the Academy. All members are expected to attend Ordinary Sessions.
- 6.2 The General Meeting may convene in an Extraordinary Session by decision of the President, the Board or at the written request of at least 1/5 of total membership⁴³.
- 6.3 The venue and dates of Ordinary and Extraordinary Sessions of the General Meeting shall be determined by the Board⁴⁴. Sessions of the General Meeting shall be convened by a written invitation, including a proposed agenda, to be distributed to all members of the academy at least one month prior to the meeting.
- 6.4 The General Meeting shall make, in particular, the following decisions:
 - 6.4.1 Receive and approve the Annual Report of the Academy;
 - 6.4.2 Issue overall policy guidelines to the Board⁴⁵;
 - 6.4.3 Review the activities, present and future, of the Academy⁴⁶;
 - 6.4.4 Elect the Officers of the Academy;
 - 6.4.5 Elect the Ordinary Members of the Board;
 - 6.4.6 Appoint the auditors of the financial administration of the academy⁴⁷;
 - 6.4.7 Review and approve reports and accounts submitted to it;
 - 6.4.8 Award medals, prizes and other honours on behalf of the academy.
- 6.5 The General Meeting may make formal decisions only if at least one-half of the membership of the Academy is present. If within one hour after the scheduled opening of a General Meeting less than one-half of the membership is present, the session shall be adjourned. In that case the Board shall invite all members to a second session that may make formal decisions without a quorum requirement provided that there are no changes in the agenda and provided that at least two weeks have lapsed after the adjournment⁴⁸.

⁴² *There is an important overall choice to be made here: (a) either the General Meeting has essentially a supervisory role with the Board acting as the main decision-making body on all operational affairs of the Academy; or (b) the General Meeting is the body that takes most of the decisions with the Board charged with their implementation. The statutes presented here opt for the first approach: Operational management is in the hands of the Board subject to supervision and guidance by the General Meeting. If the other choice is made—quite feasible for smaller academies—the provisions on the powers of General Meeting and of the Board need to be reshuffled substantially as what are now powers of the Board need to be transferred to the General Meeting.*

⁴³ *Extraordinary sessions may be convened for celebrations, but also to settle serious disagreements. For that reason, the provision as drafted allows all potential sides in a possible disagreement to convene an Extraordinary Session of the General Meeting so that no side can block the other.*

⁴⁴ *Even in situations of conflict the Board is still the Board, implying that it is the duty—“shall”—of the Board to make appropriate arrangements (including the allocation of funds) for all General Meetings.*

⁴⁵ *See footnote 42. This provision is inappropriate if the General Meeting is in charge of operational management.*

⁴⁶ *See footnote 42. If the General Meeting would be in charge of operational management this list should also state explicitly that the General Meeting decides on budgetary matters.*

⁴⁷ *Although it is very specific, it is best to entrust the General Meeting with this decision to ensure a maximum of transparency and credibility. After all, the decisions of the Board and of the Executive Director are the objects of the audit.*

⁴⁸ *The precise details of this provision need to be determined in the light of the local situation. A quorum of one-half may be too high for one academy and it may be too low for another. Also, it may be preferable to mention a precise number rather than a percentage. However, one aspect holds true in all situations: the quorum required goes up whenever the decision-making powers of the General Meeting increase. Otherwise, a relatively small group of members may be able to hijack the decision-making process of the academy. See also footnote 84.*

- 6.6 Unless provided otherwise, decisions of the General Meeting shall be taken by a majority vote, abstentions not considered a vote. Decisions shall be made by a show of hands unless the General Meeting decides to vote by secret ballot. In case of a tie the President shall have a second vote.
- 6.6.1 Voting on the election of the Officers of the Academy and of the Ordinary Members of the Board shall always be done by secret ballot;
- 6.6.2 If there is more than one candidate for a specific position as Officer of the Academy or as Ordinary Member of the Board, the candidate who receives one-half of the votes, abstentions not considered a vote, shall be elected. If no candidate receives one-half of the votes, the candidate with the fewest votes shall be withdrawn from the list of candidates. Voting shall then be repeated for the remaining candidates until a single candidate obtains a majority of the votes, abstentions not considered a vote⁴⁹.

⁴⁹ Clearly, this provision can be made much more elaborate, but this should suffice for a General Meeting without managerial tasks. Special provisions are needed for the election of Academy Officers and other Board members as there may be several candidates competing for the same position.

Article 7: Board⁵⁰

- 7.1 The Board shall consist of the Officers of the Academy and three Ordinary Members, all elected from among the members of the Academy⁵¹.
- 7.2 The members of the Board shall be elected by the General Meeting on the basis of a proposal from an ad hoc Nominating Committee appointed by the Board at least 12 months prior to the expiration of the terms in office of the incumbent Academy Officers and Ordinary Board Members⁵².
- 7.2.1 The Nominating Committee shall consist of members of the Academy that have been active in activities of the Academy and that do not seek election into the new Board. In the composition of the committee there shall be balance between disciplines, age and gender;
- 7.2.2 The Nominating Committee shall request all members of the Academy to submit candidates for election as Academy Officer and/or Ordinary Board Member. Self-nominations shall not be considered;
- 7.2.3 The Nominating Committee shall request incumbent Academy Officers and Ordinary Board Members who are eligible for a second term to indicate whether or not they seek such a second term;
- 7.2.4 At least one month prior to the General Meeting where the election is to take place, the Nominating Committee shall inform the Board in the strictest confidence of the proposed slate of new Academy Officers and Ordinary Board Members⁵³;
- 7.2.5 All information obtained by the members of the Nominating Committee, the members of the Board or the staff of the Academy on persons considered for election shall be treated as confidential to protect their privacy⁵⁴.
- 7.3 The Officers of the Academy and the Ordinary Members of the Board shall be elected for a term of three years and shall be eligible for re-election for one additional term, either in the same position or in another⁵⁵. However, if a member of the Board is elected President, he/she may have a total of three terms as member of the Board⁵⁶.

⁵⁰ To repeat the message: This particular provision also reflects the choice of having a General Meeting with an overall supervisory role and a Board charged with all tasks of operational management, including financial and budgetary matters.

⁵¹ Local preferences should determine the precise numbers. Also, the number of officers can be enlarged (more Vice-Presidents?) and that of the Ordinary Members reduced.

⁵² An independent Nominating Committee (or Search Committee) is essential as Board members may be up for re-election, which precludes a formal role for the Board itself. In this provision size and composition of the Nominating Committee are left to the Board, but any statutes can of course easily provide guidance or even instructions on these issues.

⁵³ This provision is designed to ensure that the incumbent Board can live with the proposal of the Nominating Committee and to minimise the chance of controversy at the General Meeting. It is best if the Nominating Committee were to present a full slate of new officers and other Board members to the General Meeting so that the meeting can say yes or no to the group as a whole. However, this may not be possible, in which case the General Meeting must choose between candidates. See the provisions of 6.6.2.

⁵⁴ Same comment as in footnote 41.

⁵⁵ A term of four years (maximum eight) would also be okay, but a term of two years (even when it becomes four years) seems too short to be effective. Experience shows that most newly elected officials without much relevant background need at least a year or so to come to grips with the job, then need several months to develop their own plans and initiatives plus another year at least to implement these plans and initiatives. Accordingly, a two-year term invites a wait-and-see attitude, as well as a risk of inaction, particularly when re-election for a second term is not certain.

⁵⁶ Continuity is especially important for the President, both within the Academy, but also in respect of its external relations. Hence, the option to extend the President's terms in office.

- 7.4 For the purpose of continuity, during the second and final term of an incumbent President the Nominating Committee may recommend a President-Elect who shall be, or become, a member of the Board.
- 7.5 The Board shall fill any vacancy caused by death, resignation or incapacity of any of its members for the remainder of his/her term. A person filling a vacancy shall be eligible for election, thereafter, for two normal terms.
- 7.6 Subject to overall policy guidelines of the General Meeting, the Board shall be empowered to make decisions on all matters affecting the Academy. In particular, the Board shall make the following decisions⁵⁷:
- 7.6.1 Manage, coordinate and supervise all affairs of the Academy, including its financial resources and other assets;
- 7.6.2 Convene the sessions of the General Meeting and distribute invitations, including an agenda, to the members of the Academy;
- 7.6.3 Prepare a draft annual report of the Academy and submit it to the General Meeting for approval;
- 7.6.4 Appoint standing and temporary committees as and when the Board deems such committees necessary⁵⁸;
- 7.6.5 Consider any reports and accounts to be submitted to the General Meeting for review and approval by that meeting⁵⁹;
- 7.6.6 Prepare decisions of the General Meeting to award medals, prizes and other honours to scientists for outstanding achievements;
- 7.6.7 Adopt bylaws to give effect to the provisions of these Statutes. The Board shall inform all members of the academy of any bylaws it may adopt⁶⁰.
- 7.7 The Board may only take formal decisions if there is a quorum of at least four members. The Board shall decide by a majority of votes, abstentions not considered a vote. In case of a tie, the President shall have a second vote. Decisions shall be made by a show of hands unless the Board decides to vote by secret ballot. In the interval between meetings of the Board a vote may be taken by email⁶¹.
- 7.8 The Board shall meet at least four times a year⁶² and the Minutes of its meetings shall, when confirmed, be sent to all members of the Academy.

⁵⁷ *Again: All this applies only to a Board with managerial responsibilities.*

⁵⁸ *Most existing academies have a range of committees, such as: Finance Committee, Awards Committee and Foreign Relations Committee. Whenever such a committee is established, it is appropriate for the Board to also adopt special bylaws to govern its operation.*

⁵⁹ *This also implies that no reports will go to the General Meeting without having been considered first by the Board—which is as it should be.*

⁶⁰ *There is quite a range of possible bylaws. Some may be needed to add detail to the provisions of these statutes—for example, in relation to the administrative aspects of the membership election procedure. Other bylaws may cover aspects not dealt with in these statutes at all—such as the operation of newly created committees. One other possible topic for bylaws is membership fees: level or levels, method of payment, consequences of non-payment, etc.*

⁶¹ *The provisions on decision-making by the Board can be simpler than their equivalent for the General Meeting, not because Board decisions are less important, but because the Board is a much smaller body. For obvious reasons a provision on e-voting has been added. Again, the provision may have to be adapted to local conditions, especially when it is decided to have a larger or smaller Board.*

⁶² *But in many situations that may be on the low side.*

Article 8: Officers⁶³

- 8.1 The Academy shall have the following officers: a President; a Vice-President; a Secretary General and a Treasurer⁶⁴.
- 8.2 The President shall be the principal officer of the Academy and he/she shall represent the Academy externally⁶⁵. The President shall preside over all meetings of the Board and all sessions of the General Meeting. He shall present reports on the academy's activities to the Board and to General Meetings.
- 8.3 The Vice-President shall take the place of the President if the President is unable to attend meetings of the Board or sessions of the General Meeting or is unable to represent the Academy externally. The Vice-President may discharge such other responsibilities as the President assigns to him/her⁶⁶.
- 8.4 The Secretary General shall be responsible for all official records, including the Register of Members, of the Academy and for all official correspondence of the Academy, except that which relates to finance. He shall preside at meetings of the Board and at sessions of the General Meeting if the President and Vice-President are unable to attend.
- 8.5 The Treasurer shall be responsible for the financial records and administration of the Academy and for the management of all its financial resources and other assets. The Treasurer shall report annually, and at such times as the Board may determine, to the Board on the finances and accounts of the Academy. He shall present a report to each Ordinary Session of the General Meeting on the audited accounts of the Academy.
- 8.6 Any Officer of the Academy or an Ordinary Member of the Board who behaves in a manner that is incompatible with the responsibilities of his/her office or who accepts a position that is in conflict with those responsibilities, including a paid position at the Academy, shall resign his/her office. If he/she refuses to do so, the Board shall propose to the General Meeting to remove him/her from office⁶⁷. If an officer is expelled as a member of the academy, his/her term in office ends automatically.

⁶³ Of course, every academy will have a President and should have a Vice-President, but a Secretary General and a Treasurer are not strictly necessary, while putting them collectively in the category 'Officers of the Academy' is also a matter of choice. However, having Officers elected from among the membership conveys the message that the Academy is truly managed by the members themselves. Also and more practically: Even if there is no Secretary General or Treasurer, their work has to be done anyway.

⁶⁴ The number and type of officers is a matter of choice as well. For example, many of the larger academies have a special Foreign Secretary to strengthen the position of the Academy in international relations. There also may be more Vice-Presidents, which makes it possible to assign specific responsibilities to them (such as: Membership issues, Science education, Awards, etc.).

⁶⁵ The term 'representation' here refers to flying the flag—it does not refer to entering into financial or legal commitments. See the provisions on Financial Management.

⁶⁶ This should also make clear that ultimately there is only one boss: The President.

⁶⁷ That is: he/she may stay on as member. Strictly speaking, the last sentence is not needed as all Board members must be academy members. However, in case of conflict

Article 9: Executive Director⁶⁸

- 9.1 The Board shall appoint an Executive Director of the Academy as the highest administrative officer of the Academy for a term in office set by the Board, but not less than three years, and for a salary and other benefits also set by the Board⁶⁹.
- 9.1.1 Not later than 12 months prior to the end of his/her term in office the Board shall request the incumbent Executive Director to indicate whether or not he/she seeks appointment for another term in office;
- 9.1.2 If the Executive Director seeks another term, the Board shall decide whether or not to re-appoint the incumbent Executive Director⁷⁰;
- 9.1.3 If the incumbent Executive President is not available or if the Board decides that a new Executive Director needs to be appointed, the Board shall appoint a Search Committee from among its members;
- 9.1.4 The Search Committee shall publicly advertise the vacancy, as well as the criteria for appointment. It shall also seek input from academy members⁷¹;
- 9.1.5 The Board shall appoint a new Executive Director not later than two months before the end of the term of the incumbent Executive Director.
- 9.2 The Executive Director is accountable to the President of the Academy⁷².
- 9.3 Subject to guidelines and instructions of the Board, the Executive Director shall be responsible for the administration of the Academy and for the management of the office of the Academy, including the appointment of staff, the setting of salaries and other benefits and the general conduct of the staff⁷³.
- 9.4 The Executive Director shall support the Board in formulating and implementing the policies of the Academy and he/she shall maintain working relationships with all organisations that pursue objectives similar to those of the Academy⁷⁴.
- 9.5 If the Executive Director behaves in a manner that is incompatible with the responsibilities of his/her office, he/she shall resign his/her office. If he/she refuses to do so, the Board shall remove him/her from office⁷⁵.

⁶⁸ Again the observation that this position assumes that the Academy has a certain size. For smaller academies it may just not be realistic to have a salaried Executive Director, not even part-time. In that case, one or more of the members of the Board have to do the work—as volunteers.

⁶⁹ Accordingly, the Executive Director is a paid employee of the Academy, full-time or part-time. This is not only a matter of expediency, but it also is a matter of principle to make clear how the position of Executive Director relates to the elected positions of the Officers of the Academy.

⁷⁰ It is only fair that an incumbent Executive Director has the right of first refusal, especially when he/she does a good job.

⁷¹ In most cases a maximum of transparency is best.

⁷² The Executive Director can also be made accountable to the Board as a whole, but this may cause confusion if the Board is divided.

⁷³ No doubt, a more detailed and elaborate provision can be formulated, but this describes clearly two important components of the job: administration and office management. Accordingly, the Secretary General and the Treasurer may have ultimate responsibility for the correspondence and the finances of the Academy respectively, but it is the Executive Director who does most of the actual work.

⁷⁴ A good Executive Director may do much more than administration and office management—If an academy lets him/her, as all larger academies should. Based on his/her specific role as the highest administrative officer of the Academy, he/she can also have a voice in the decision-making processes of the Academy and in the contacts with other organisations. Presidents and Board members may come and go, but a good Executive Director is essential to bring a degree of continuity and stability to an Academy.

⁷⁵ The Board appointed the Executive Director and so the Board should fire him/her.

Article 10: Financial Management⁷⁶

- 10.1 The Academy is authorised to accept and receive grants, donations, gifts, bequests, trust funds and prizes from national or international entities, public or private, or from individuals, as well as fees from its members or for any services it may render. Acceptance of such financial contributions shall be effected by the Executive Director under guidelines issued by the Board.
- 10.2 The Officers of the Academy, the Ordinary Members of the Board and other Academy officials elected from amongst the members shall not receive any salaries or other honoraria or fees. However, they shall be reimbursed for any personal expenses made in performing their duties, while the Academy may compensate, in whole or in part, the organisation where they work for the costs of their salary⁷⁷.
- 10.3 The Academy shall enter into financial obligations in relation to third parties only on the basis of an explicit decision of the Executive Director. The Executive Director shall enter into such financial obligations only for expenditures that are included in a budget approved by the Board⁷⁸.
- 10.4 The Academy may borrow money from established financial institutions and it may invest any funds it does not need to disburse. Investments shall be made only in financial instruments that carry a minimum of risk. Transfer of Academy funds for investment purposes shall be effected by the Executive Director upon a written instruction from the Board signed by the President⁷⁹.
- 10.5 The accounts of the Academy shall be audited in accordance with generally accepted accounting and auditing standards⁸⁰.

⁷⁶ This provision aims to set out some general principles. More detailed provisions may be needed, but these could be adopted as part of the Academy's bylaws.

⁷⁷ In most situations it may be appropriate to provide that any work for the Academy is done on a pro bono basis and not for a salary or honorarium. However, the home-organisations of an academy Officer may be compensated for the time 'lost' by that organisation to the Academy. There also may be situations where the position of Academy Officer should carry a salary. Accordingly, this provision needs to be adapted to the local situation.

⁷⁸ One (intended) result of the way this provision reads is that the Executive Director will have considerable discretion in entering into financial obligations if the Board adopts a budget with only a few very broad categories. If the Board does not wish to give so much freedom to the Executive Director, it should adopt each year a comprehensive budget for all major (categories of) activities of the Academy. An alternative would be to stipulate that the Executive Director needs approval from the Board (or the Treasurer) for every transaction or for transactions that exceed a certain amount. However, such an arrangement appears feasible only for smaller academies.

⁷⁹ No speculation with academy funds on the stock market.

⁸⁰ With the auditors being appointed by the General Meeting. See provision 6.4.6.

Article 11: Publications and Statements⁸¹

- 11.1 Publications or statements on behalf of the Academy shall not be made public until their public release is approved by the Board. In particularly urgent matters the President of the Academy may decide on the public release of a publication or statement provided that its content is in line with standing policies of the Academy.
- 11.2 The Board shall appoint an Editor or Editorial Committee of the Academy, preferably from amongst its members, to supervise the preparation of publications for public release on behalf of the Academy⁸².
- 11.3 If the Editor or the Editorial Committee considers a publication ready for release, he/she/it shall submit a proposal to the Board on the manner and mechanisms of publication and dissemination⁸³.
- 11.4 The President or the Vice-President shall supervise the preparation of all Academy statements. If the President or Vice-President considers a statement ready for release, he/she submits a proposal to the Board on the manner and mechanisms of dissemination.

⁸¹ A provision on publications and statements may not be necessary for all academies. However, in view of the impact a publication or statement may have on the reputation of an academy, it may be wise to set out some basic principles in the statutes.

⁸² Note that the Editor or the Editorial Committee is charged with supervising the preparation of a publication for public release and not with the task of preparing it for publication. If the Editor/Editorial Committee is recruited from among Board members, there is less need for formal reporting and consultation.

⁸³ This implies that the Board is not asked to approve the contents of the publication or statement. In essence, the approach suggested here is that any publication or statement must meet strict (methodological) quality standards, but that within an Academy there is no room for censorship.

Article 12: Final Provisions

- 12.1 Amendments to these Statutes may be made by the General Meeting on the basis of a proposal from the Board. Proposed amendments shall be put to a vote only if at least two-thirds of the members of the academy are present at the General Meeting. Approval of a proposed amendment shall require a two-thirds majority vote, abstentions not considered a vote⁸⁴.
- 12.2 The Academy may be dissolved at an Extraordinary General Meeting, especially convened for that purpose. A proposal to dissolve the Academy shall include arrangements to dispose of the assets of the Academy.
- 12.2.1 The proposal to dissolve the Academy shall be put to a vote only if at least two-thirds of the members of the Academy are present at the Extraordinary General Meeting. Approval of the proposal shall require a two-thirds majority vote, abstentions not considered a vote⁸⁵.
- 12.2.2 If within one hour after the scheduled opening of the Extraordinary General Meeting less than two-thirds of the membership is present, the President shall adjourn the session. He/she shall then invite all members to a second session that may take the decision to dissolve the Academy without a quorum requirement and by a majority vote, abstentions not considered a vote.

⁸⁴ For such an important decision Board and General Meeting should be required to work together, while the decision should not only require a two-thirds majority, but also a higher quorum. This is to prevent a relatively small group of members to amend the statutes for their own purposes, in effect hijacking the Academy. By way of example: If an Academy has 200 members, provision 6.5 sets the regular quorum of a General Meeting at 100 members, implying that as few as 51 members could change the statutes. With the increased quorum requirement of two-thirds, these numbers become 134 (quorum) and 90 (vote), which are better thresholds for these (potentially) crucial decisions.

⁸⁵ For quorum and voting requirements, see the previous footnote. However, in case of dissolution the actual number of members participating in the decision may be quite small.

STRATEGIC PLAN CONTENTS

Items for Academies to Consider

Strategic Plan Template

Context/Background

Describe the genesis of the academy and the science, technology and innovation landscape within which it will operate.

Vision

The direction and mental image of a possible and desirable future state that the Academy can contribute towards. This image may be as vague as a dream or as precise as a goal statement.

Mission Statement

This is a clear and succinct representation of the purpose of existence of an academy, incorporating socially meaningful and measurable criteria. A mission may address concepts such as the societal perception, the targeted stakeholders, products/services offered, the geographic domain and expectations of growth and advancement.

Values

The elements that form the foundation of the academy's work, how it interacts with its internal and external stakeholders, and which strategies it employs to fulfill its mission. Examples of values may include: transparency, independence, relevance, accountability, integrity, etc.

Major Goal

This is a projected state of affairs that the academy plans or intends to achieve within a finite time in the longer term.

Objectives

In order to fulfill the goals of the academy, objectives are set to identify short-term, measurable effort within a designated period of time. This may further be broken down to specific objectives and are usually derived from the Statutes or Constitution.

Key Strategies

These are elaborate and systematic plans of action that the academy will employ to fulfill its objectives. Key strategies may address the thematic focus or programmatic scope for academy operations during the period of the strategic plan.

Strategic Action Items

These are specific activities or actions that the academy will undertake towards the fulfillment of its key strategies.

Monitoring and Evaluation

Articulate the means by which progress shall be reviewed throughout the implementation of the strategic plan. Monitoring should be continual while evaluation can be periodic to inform necessary remedial actions or the next strategic plan once the current one ends.

The Network of African Science Academies (NASAC) was established on 13 December 2001 in Nairobi, Kenya, under the auspices of the African Academy of Sciences (AAS) and the Inter Academy Panel (IAP).

NASAC is a consortium of merit-based science academies in Africa and aspires to make the “voice of science” heard by policy and decision makers within Africa and worldwide.

NASAC is dedicated to enhancing the capacity of existing national science academies and champions the cause for creation of new academies where none exist.

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