iap SCIENCE HEALTH POLICY

the interacademy partnership

Annual Report 2019

iap SCIENCE HEALTH POLICY

the interacademy partnership

Annual Report 2019

INTERACADEMY PARTNERSHIP ANNUAL REPORT 2019

Writing and editing
Peter McGrath
Giovanni Ortolani
Teresa Stoepler

With contributions from
Tracey Elliott, *IAP Project director*
Robin Fears, *EASAC Biosciences Programme Director*

Administrative assistance
Sabina Caris
Muthoni Kareithi
Nina Ward
Johanna Mogwitz

We would like to thank colleagues from member academies, IAP regional networks, and other IAP programmes who supplied reports on their 2019 activities.

Design & Art Direction
Rado Jagodic
Studio Link, Trieste, Italy

Printing
Grafica Goriziana
Gorizia, Italy

The InterAcademy Partnership is hosted by:

The World Academy of Sciences (TWAS)
ICTP campus
Strada Costiera 11
34151 Trieste, Italy

and

The US National Academies of Sciences, Engineering and Medicine
500 Fifth Street, NW
Washington, DC 20001, USA

@IAPartnership
www.linkedin.com/company/interacademypartnership
https://tinyurl.com/IAPyoutube
www.interacademies.org
iap@twas.org
secretariat@iapartnership.org

Contents

Welcome by IAP Presidents

The need for robust evidence-informed policymaking and an engaged and inclusive science community underpinning it has never been more important, as the world grapples with a global pandemic and looming climate crisis. The academies must lead by example.

Since the InterAcademy Partnership (IAP) was launched in South Africa in 2016, we have continued to harmonise our strategies, operations and outreach; integrate the efforts of our member academies and our regional networks; and undertake global projects on urgent systemic issues. These activities have informed policy at national, regional and global levels, engaged our members more inclusively and brought a greater diversity of voices into the international science-policy arena.

Our major triennial gathering, the IAP General Assembly and conference (see pages 11-14), was convened in 2019. With representatives from some 60 academies in attendance, it afforded the opportunity to reflect on lessons learned over the past three years since the merging of our networks and to identify ways we can continue to improve, including through building the capacity of our member academies. The conference focused on the role of academies in supporting the Sustainable Development Goals, encouraging members to be more proactive, especially at the national level. We would like to express again our gratitude to our hosts, the Korean Academy of Science and Technology (KAST), for their gracious and generous hospitality, and all our members for approving an ambitious new Strategic Plan that will guide our actions for the next three years.

Indeed, in this volume we take the opportunity to reflect on our activities and publications since the official launch of the InterAcademy Partnership. None of this would be possible without the financial support of the Government of Italy, which provides our core funding. Also essential is the in-kind and financial support we receive from our member academies, our four regional networks, and especially the two host academies of the IAP secretariat offices, the U.S. National Academies of Sciences, Engineering and Medicine (NASEM) and The World Academy of Sciences (TWAS).

The cornerstones of our work are the four IAP regional networks – the Association of Academies and Societies of Sciences in Asia (AASSA), the European Academies Science Advisory Council (EASAC), the Inter-American Network of Academies of Sciences (IANAS) and the Network of African Science Academies (NASAC). They provide our studies with a diversity of inputs and perspectives and contextualise our recommendations regionally (see pages 32-42).

In 2019, we initiated a new major regional-to-global project on 'Climate Change and Health', which follows the model of our successful 'Food and Nutrition Security and Agriculture' (FNSA) project published in 2018. Outreach of the FNSA recommendations continues to be an important priority and relevant to most of the UN Sustainable Development Goals. Two major projects at the science-policy interface reported in 2019, resulting in major publications on the Sustainable Development Goals (SDGs) and the role of African science academies in Africa's sustainable development (see pages 16-17). These projects are helping academies develop stronger links with the United Nations and African Union, respectively.

The IAP Biosecurity Working Group has continued its collaboration with UN agencies, the Biological and Toxin Weapons Convention (BWC) and the Organisation for the Prohibition of Chemical Weapons (OPCW, see pages 28-30). Meanwhile, IAP has continued to be active in the global health arena, including through building the leadership skills of another cohort of Young Physician Leaders (YPL, see pages 25-27). Our ongoing Science Education Programme seeks to reform and develop science education on a global scale, especially in primary and secondary schools, with a pedagogy based on inquiry-based science education (IBSE, see pages 22-24).

IAP, with the vital inputs of our member academies and regional networks, is becoming increasingly recognized for the advice it provides on global, regional and national issues at the interface of science and policy. Over the past three years, we have demonstrated our effectiveness in convening key stakeholders, developing consensus statements and publishing synthesis reports. We look forward to continuing to build on our body of work in providing effective and evidence-based solutions to today's most pressing problems, and working with other like-minded organisations. Indeed, with the onset of the COVID-19 pandemic, it is more important than ever that the best available scientific evidence is in the hands of decision makers at every scale, and the academies are among the best placed to help ensure that happens. ■

Volker ter Meulen, *IAP President*

Depei Liu, *IAP President*

Vision, Mission and Structure

The InterAcademy Partnership (IAP) is a global network of 140 academies of science, medicine and engineering that brings together many of the world's best scientific minds.

Individually and collectively, our member academies play a vital role in supporting, promoting and communicating science, influencing national and international policy on science-related matters, and fostering the next generation of young and talented scientists.

Reflecting the principles of its membership – independence and objectivity – IAP strives to be free from national or disciplinary bias to ensure that its actions and decisions are strictly merit-based and reflect the best scientific evidence available. Consequently, it is one of the leading organisations in the world with the intellectual capacity, credibility and independence to function as an authoritative and impartial adviser on scientific issues of regional and global importance.

IAP provides a platform for member academies to

- share good practice, learn from each other and build their capacity and visibility;
- develop common positions and agree to actions/interventions on regional and global issues of shared interest;
- build collaborations among academies and with key stakeholders in other networks and sectors;
- promote the importance of inclusive science for generating new knowledge, informing robust decision-making for good governance, and building the science literacy of global citizens; and
- facilitate science serving society as a global public good.

Thus, IAP has four main strategic priorities:

- build the capacity of, and empower, regional networks of academies and their national members;
- empower academies and regional academy networks to provide independent, evidence-based, authoritative advice on global, regional and national issues;
- promote the importance of science in research, education, and literacy; and
- build IAP as a progressive and more resilient global academies network.

IAP currently has three components: IAP Science and IAP Health, managed by the IAP Secretariat based in Trieste, Italy; and IAP Policy, managed by the IAP Secretariat based in Washington, DC, USA. This structure is being further streamlined to maximise the network's effectiveness.

Integral to IAP's operations are its four regional networks – the Association of Academies and Societies of Sciences in Asia (AASSA), the European Academies' Science Advisory Council (EASAC), the Inter-American Network of Academies of Science (IANAS), the Network of African Science Academies (NASAC) – and the Global Young Academy (GYA), which facilitates access to the perspectives of early career researchers.

By bringing its member academies together into regional and global networks, IAP serves to increase the visibility and impact of the academies as they work together, speaking with 'one voice' to governments, international organisations and other stakeholders. ■

Overview

Looking Back: An overview of IAP's goals and key activities in 2019

IAP is the global network of academies of science, engineering and medicine. Its ambition is for the world's academies to play a vital role in ensuring that science serves society inclusively and equitably and underpins global sustainable development. To achieve this, IAP convenes and empowers its 140 member academies to work collaboratively on issues of global, regional and national importance.

The current landscape of international science is complex and continues to evolve, with an increasing number of new, established and reconfigured organisations and networks providing science advice for policy. In alignment with Sustainable Development Goal 17 (SDG#17), IAP developed a strategic plan that sets out IAP's niche in this ecosystem, with a renewed emphasis on partnership and collaboration with other like-minded partners.

As highlighted in its Strategic Plan (2019-2021), endorsed by members during the 2019 General Assembly (see page 11), IAP is uniquely placed to:

1. Build the capacity of, and empower, regional networks of academies and their national members, who represent excellence in science, engineering and medicine in their countries;
2. Empower academies and regional academy networks to provide independent, authoritative advice on global, regional and national issues through synthesis reports, consensus statements, foresight studies, critiquing public policy processes and outputs, and convening key stakeholders;
3. Communicate the importance of science, engineering and medicine in terms of research, education, literacy, public discourse, and outreach;
4. Build IAP as a progressive and more resilient global academies network by strengthening governance, empowering the secretariat, and designing and implementing cohesive policies.

Strategic Priority 1: Capacity Building

IAP helps to build the capacity of its member academies at global, regional and national levels:

- At the **global** level, IAP is active in projects and activities that bring together the expertise present in the diversity of its membership on wide-ranging topical and/or urgent issues. Its consensus reports, statements and commentaries speak to the United Nations (UN) and its agencies, as well as other international bodies, and in doing so help build the capacity and understanding of academies on global governance systems while supporting evidence-based decision making. In particular, IAP published a major report on the role of academies in implementing the Sustainable Development Goals (SDGs) that helped build links with the UN (see pages 16-17). The project enhanced the understanding of academies of global and regional policymaking processes and entry points into these often complex systems.
- At the **regional** level, IAP works closely with and through its four regional networks. The Association of Academies and Societies of Sciences in Asia (AASSA), the European Academies' Science Advisory Council (EASAC), the Inter-American Network of Academies of Science (IANAS) and the Network of African Science Academies (NASAC) receive IAP grants to enable them to undertake regional activities, including workshops and studies of local relevance. The funds provided by IAP are typically used to leverage additional funds that help expand the activities and enhance their impact (see pages 32-42). IAP's interregional projects on Food and Nutrition Security and Agriculture and Climate Change and Health also help to build capacity within and between regions.

  With a focus on Africa, a major IAP report published in 2019 highlighted the role African science academies can play in the continent's sustainable development and helped build links with the African Union (see page 17). This project enhanced the understanding of NASAC members of African policymaking processes.
- At the **national** level, IAP encourages the engagement of all its member academies, including newly established and under-resourced academies, in its numerous global and regional activities. In contributing to these consensus reports, statements and commentaries, IAP provides member academies with a voice on urgent and topical issues that they can use to engage with their own national policymakers and other key stakeholders. Such engagement helps to build the credibility and confidence of national academies both within their nations and beyond. Where feasible, capacity-building grants are also provided to individual academies each year to pursue strategic national initiatives.

Strategic Priority 2: Science Advice

IAP works on wide-ranging policy areas which are underpinned by science.

- In 2019, IAP launched a new landmark project on 'Climate Change and Health', engaging all four regional networks in an interregional-to-global synthesis study, modelled on the Food and Nutrition Security and Agriculture project that reported in 2018. This new project is generating significant interest and has already been presented at several international fora, including the World Health Summit in Berlin and the World Science Forum in Budapest (see pages 18-21).
- Dissemination of the IAP 'Food and Nutrition Security and Agriculture' global synthesis report and its four regional volumes continued. Members of the project from IAP and its regional networks – AASSA, EASAC, IANAS and NASAC – presented the regional and global findings at scientific sessions organised by the International Food Policy Research Institute (IFPRI) and at the annual meeting of the American Association for the Advancement of Science (AAAS).
- IAP and NASAC collaborated with the Academy of Science of South Africa (ASSAf) on the implications of neonicotinoid insecticide use for ecosystem services and sustainable agriculture in Africa. The study was conducted between October 2018 and October 2019 and involved two workshops with leading expert scientists from 17 African countries, as well as an extensive review of relevant African research. The report was launched at the 15th Annual Meeting of African Science Academies (AMASA-15) in Ghana in November.
- During COP25 of the UN Framework Convention in Climate Change (UNFCCC), IAP released a Communiqué on Tropical Forests**,** outlining necessary measures for protecting forests worldwide and for reforestation as critical components for tackling climate change (see page 54).
- IAP launched a Statement 'A Call for Action to Declare Trauma as a Disease', encouraging countries to address trauma through an integrated comprehensive approach in their respective health agendas (see page 18).
- The IAP Biosecurity Working Group continued its engagement with the Biological and Toxin Weapons Convention (BWC), participating in both the BWC Meeting of Experts and the Meeting of States Parties (see pages 28-29).
- Notable policy-focused workshops included 'Multidisciplinary research in epidemic preparedness and response', and 'Addressing the social determinants of global mental health in the Sustainable Development Goals era', in partnership with the UK's Academy of Medical Sciences; and 'Arctic warming and microbial threats', in partnership with EASAC and the US National Academies of Sciences, Engineering and Medicine (NASEM) (see pages 29-30). The reports of these three workshops will be available in early 2020.

Strategic Priority 3: Education and Outreach

IAP's education and outreach activities support inquiry-based science education and the professional development of young scientists and medical professionals. Activities in 2019 included:

- The Global Council of IAP's Science Education Programme in Bangkok, Thailand, held its

annual meeting. Taking advantage of the presence of the IAP experts, the hosts, the National Science Museum of Thailand, also organised a 'Policy Forum on Science Literacy: Roles of science museums and science centres' (see pages 22-24).

- The 'Third Belt and Road Teenager Maker Camp & Teacher Workshop' took place in Nanning, China, with the support of the IAP SEP and participation (via NASAC) of teachers and students from Africa.
- IAP SEP members and a dedicated working group also finalised a 'One Belt One Road' curriculum aimed at helping school children across many Asian and African countries understand the contributions that their cultures and civilisations have provided to scientific thinking.
- In addition to institutional strengthening, IAP supports individuals through its young scientists, young physicians and women in science leadership programmes. In 2019, IAP renewed its commitment to sustain the Global Young Academy (GYA), now a full member of IAP. IAP also welcomed a new cohort of Young Physician Leaders (YPL) who received leadership training at the World Health Summit in Berlin, Germany, and co-organised with the GYA a Science Leadership Workshop for young scientists at the World Science Forum in Budapest, Hungary. Between these two events, of the 51 participants, 29 (57%) were women (see pages 25-27).
- The Organisation for the Prohibition of Chemical Weapons (OPCW), in collaboration with IAP and The World Academy of Sciences (TWAS), organised a workshop for early-career scientists in Trieste, Italy. More than 40 young scientists from developing countries were trained in issues of the dual-use of research and responsible research practices (see page 29).

Strategic Priority 4: The Network

IAP continues to build a more progressive and resilient global academies network.

- The Trieste, Washington, DC, and regional network IAP secretariats met on January 28-29 in Trieste, Italy, to identify concrete steps toward a more coherent, efficient and strategic IAP, share lessons learned regarding secretariat roles, and increase overall coordination and internal communication between IAP and the regional networks.
- In April, IAP held its triennial General Assembly in Songdo, Korea, to discuss the organisation's Strategic and Implementation Plans and welcome new leadership and new members (see pages 11-13). Following the General Assembly, IAP also initiated the development of a new set of statutes that codify how IAP will operate as one unified network of academies to more effectively work together to ensure science serves society in an inclusive way.
- In 2019, Masresha Fetene, Executive Director of the Ethiopian Academy of Sciences, succeeded Daya Reddy as IAP Policy co-chair.
- The role of IAP Treasurer was expanded to provide greater oversight over all IAP finances and to report directly to the Steering Committee.
- IAP initiated a new communication strategy, including a refreshed website and expanded social media presence. This process was aided by the appointment, in March, of a Communications Assistant based at the Trieste secretariat. The IAP website (www.interacademies.org) continues to be an important tool to disseminate IAP's work and amplify the voice of its member academies. From 2018 to 2019, the number of users increased by over 70% and the number of unique page views by more than 40%. In December 2019, IAP reached the landmark number of 2,000 'followers' of its Twitter account, @IAPartnership, doubling its follower base in just over a year. IAP also continued distributing its quarterly e-newsletter with news, events, updates and opportunities of IAP programmes and projects for IAP members and other interested parties, and launched a new IAP Young Physician Leaders (YPL) newsletter dedicated to the YPL alumni. A new YouTube channel (https://tinyurl.com/IAPyoutube) was also set up that hosts original videos, including a series on Urban Health (see pages 18-19) and others linked with, for example, the release of the IAP Communique on Tropical Forests. ■

IAP General Assembly and Conference

Every three years, IAP holds a General Assembly during which the leadership and representatives of its member academies meet to discuss the organisation's strategy and activities, elect its leadership, and welcome new members. In 2019, IAP elected two new co-chairs and organised a two-day conference 'Science and the Sustainable Development Goals: The Role of Academies'.

General Assembly

IAP held its triennial General Assembly in Songdo, Korea, on 11 April 2019. Generously hosted by the Korean Academy of Science and Technology (KAST), the meeting brought together over 100 representatives of science and medical academies from 54 countries, IAP's four regional networks and the Global Young Academy (GYA), as well as the International Science Council (ISC) and other guests.

This gathering marked changes to both the governance and structure of IAP, as well as welcoming new members and approving a new strategic plan.

Governance

Two new co-chairs were welcomed to the IAP Steering Committee, the decision-making body that oversees the strategic direction of the network, comprising the six co-chairs of its three constituent networks – Science, Health and Policy.

Cherry Murray (USA) and Peggy Hamburg (USA) replaced Volker ter Meulen (Germany) and Detlev Ganten (Germany) as co-chairs of IAP Science and IAP Health, respectively. They joined the four incumbent IAP co-chairs, Richard Catlow (UK), Daya Reddy (South Africa), Depei Liu (China) and Krishan Lal (India). Depei Liu and Volker ter Meulen remain as IAP Presidents.

"I am thrilled to be part of this partnership of national academies, and am looking forward to IAP making even more impact on global science policy, policy for global science, and furthering the use of science to enable global sustainable development, represented by the United Nation's Sustainable Development Goals, the SDGs," said Cherry Murray.

The scrutiny of the member academies' votes.

IAP GENERAL ASSEMBLY AND CONFERENCE

Participants at the IAP Conference and General Assembly, Songdo, Korea.

"In doing this, I would like to make sure that we are more inclusive, bringing diverse intellects into the partnership, including engineering and young voices. The challenges we face as humankind and the solutions we need to meet them are local, regional and global all at the same time, and that is exactly what IAP represents," she added.

"I am very excited to be a part of the leadership team of this important and unique organisation as we position it for ever greater impact in addressing the pressing challenges of our increasingly complex and rapidly changing world," said Peggy Hamburg.

Peggy Hamburg also stressed that "IAP must be a powerful voice for science and health – both in support of education and practice – and must help ensure that the best possible evidence and science-based decision-making informs policies at every level."

Later in the year, in October, Daya Reddy stepped down from the IAP steering committee to focus on his work as President of the ISC. He was replaced by Masresha Fetene (Ethiopia).

Structure

The General Assembly endorsed a revised IAP structure with one Board, one unified Executive Committee, and several thematic programme committees. The Assembly delegated to the current co-chairs and secretariat the authority to develop a detailed model for this revised structure based on these principles, which will be subject to endorsement by electronic ballot.

IAP Research was renamed IAP Policy to better reflect its work and the overarching work of IAP, and delegates agreed that effective immediately, all member academies will be considered members of IAP as a whole rather than of one or more of the constituent networks (IAP Health, IAP Science or IAP Policy).

Membership

At the 2019 IAP General Assembly, eight academies (the Global Young Academy, European Academy of Sciences and Arts, Zambia Academy of Sciences, Peruvian Academy of Sciences, Peruvian Academy of Medicine, Korean Academy of Science and Technology, Korean Academy of Medicine, and the National Academy of Sciences, Cordoba, Argentina) were accepted as full members of IAP. In the future, new applications for IAP membership will be reviewed by members of the steering committee (the six co-chairs) rather than the General Assembly to streamline the membership process.

Strategic Plan

The General Assembly also unanimously approved a new Strategic Plan and underpinning Implementation Plan. The four strategic objectives of IAP 2019-2021 are:

1. To build the capacity of, and empower, regional networks of academies and their national members, who represent excellence in science, engineering and medicine in their countries;
2. To empower academies and regional academy networks to provide independent, authoritative advice on global, regional and national issues through synthesis reports, consensus statements, foresight studies, critiquing public policy processes and outputs, and convening key stakeholders;
3. To communicate the importance of science, engineering and medicine in terms of research, education, literacy, public discourse, and outreach;
4. To build IAP as a progressive and more resilient global academies network by strengthening governance, empowering the secretariat, and designing and implementing cohesive policies.

Tolu Oni, GYA co-chair, on the IAP conference stage.

Triennial Conference

The IAP General Assembly followed a two-day conference 'Science and the Sustainable Development Goals: The role of academies', attended by nearly 200 leading scientists, policy practitioners from the United Nations (UN) system, and delegates from 54 science, medical, and engineering academies from around the world. The conference provided a platform for exploring opportunities to engage with the UN Agenda 2030, share good practices and lessons learned, and identify priority actions where academies can best add value. The agenda was informed partly by the IAP project 'Improving scientific input to global policymaking', the report of which included a 'How to…' checklist for engaging with the SDGs.

The conference's key take-home messages were:

- Academies are vital partners in the global voice for science.
- Academies can help integrate science into SDG implementation processes at national, regional and global levels; academies can use their IAP and (where relevant) ISC membership to contribute at the global level, and their IAP regional network to contribute regionally.
- National level actions are critically important because this is where policy is designed, implemented and reviewed. Examples include supporting:
  - national STI-for-SDGs roadmaps;
  - country delegations to UN policy summits and fora;
  - communication and outreach efforts to raise awareness of the SDGs amongst the science community and wider publics.
- To remain relevant, academies must adapt to and adopt the imperative for open and inclu-

Volker ter Meulen (centre) talking with delegates from member academies at the IAP conference.

sive science: think and act more inclusively. This includes:

- supporting the principles and practices of open access and open data;
- integrating knowledge across scientific fields and disciplines;
- drawing on the full diversity of scientific capacities;
- opening up their membership, working in partnership, using their convening power to draw on wide-ranging expertise and insight.

- Academies are more than just a repository of knowledge: they should also be communicators and inspirers, helping to create a vision for (basic and applied) science and its value to society, and inspiring young people to become scientists.
- Academies should harness the energy, insight and ability of young scientists and young academies, and invest in (very early) science education.
- Academies should adopt sustainable practices in their own operations: for example, reduce unnecessary travel, maximise the utility of meeting time, offset carbon costs; minimise printing, food waste and use of disposable plastic bottles, and maximise recycling of materials; and embed equality and inclusion as normal practice.
- Academies need to be proactive: don't wait to be asked!

Participants also advanced discussions on the role of academies in the 21st Century and how they should evolve to respond to today's pressing sustainable development challenges and to strengthen evidence-informed policymaking.

"The conference highlighted how the UN SDGs are being implemented at global, regional and national levels, and the opportunities these present for the academies to better play their part. Whether they are large or small, new or old, their actions are critical because policy design and implementation generally takes place at the national level," said Volker ter Meulen, IAP President.

"To fulfil their potential to support the implementation of the SDGs, national science academies need to shift from working for society to working *with* society, openly and inclusively. They must bridge the gap between knowledge production and knowledge use, push for evidence-informed policies, and help build a sustainable planet," added Depei Liu, IAP President and IAP Health co-chair. ■

Global Activities

Science for Policy

In 2019 IAP for Research become IAP Policy to better reflect its work and focus. IAP's main activities in the science-policy interface include major publications on SDGs and the role of science academies in Africa's quest for sustainable development.

Two major IAP Policy projects funded by Carnegie Corporation of New York, 'Improving Scientific Input to Global Policymaking' and 'Harnessing Science, Engineering and Medicine to Address Africa's Challenges: The role of African National Academies', were completed and published their final reports in 2019.

Both projects explored opportunities for academies to influence global, regional and national policymaking as vital members of the global science community. The projects' common overarching goals were to help raise awareness of global (United Nations, UN) and regional (African Union, AU) policy frameworks amongst the academies; mobilise and build the capacity of academies to support these frameworks; and develop long-term strategic partnerships. Each project was led by an international working group, drawn from nominations from IAP member academies, the Global Young Academy (GYA) and the International Science Council (ISC). The final year for both projects focused on publishing and disseminating the final reports and their recommendations.

Improving Scientific Input to Global Policymaking

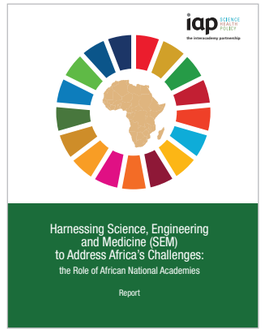
Launched in August 2016, this project explored opportunities for academies to support the implementation of the UN Sustainable Development Goals (SDGs) more effectively, encouraging academies to collaborate with key stakeholders and adopt good practice. The final report and summary were launched at the UN STI Multistakeholder Forum in New York, USA, in May 2019 (the final report, summary and further information about the project are available at https://tinyurl.com/IAPSDGsreport).

This project engaged 68 senior academies and 17 young academies through its four regional workshops, bringing together academy members and policymakers in each of IAP's four regions. It also raised awareness amongst the academies and the broader science community of the SDGs and the available conduits for science into UN policy processes, and raised awareness amongst policymakers of the key global science networks.

Furthermore, the project helped develop sustained links and working partnerships with the UN, its regional networks and agencies through participation in UN meetings and hosting regional multi-stakeholder workshops. It facilitated academy experience sharing in engaging with the SDGs and documented academy case studies of good practice – at national, regional and global levels, and informed the theme of the 2019 IAP General Assembly (see pages 11-14), the 2019-2022 IAP Strategic Plan and some national academies' strategic planning processes.

While dissemination is ongoing, direct impacts of the project to date include inspiring at least two academies to organise their own SDG-focused workshops bringing together scientists and policymakers (South Africa – water; and Morocco - health) and IAP being invited to coordinate the review of the 2019 Global Sustainable Development Report with the ISC and World Federation of Engineering Organizations (WFEO). Parts of the final report (e.g., the UN schematic) are being used by other agencies – such as the OECD and UN InterAgency Task Team (IATT) and the Technology Facilitation Mechanism (TFM) and feature prominently on their webpages and/or reports.

IAP members continue to be encouraged to add their SDG-related initiatives to the IAP online database (available under the 'Resources' tab at https://tinyurl.com/IAPSDGsreport); a valuable resource for the academies, their regional networks and the IAP.



Harnessing Science, Engineering and Medicine to Address Africa's Challenges

Launched in September 2016 as a companion to the UN SDGs project, this project explored opportunities for African academies to support the implementation of both the SDGs and the STI Strategy for Africa (STISA), underpinning UN Agenda 2030 and AU Agenda 2063, respectively.

The objectives of the project were to: mobilise African leaders in science, engineering and medicine (SEM) to explore new approaches to addressing shared challenges; strengthen merit-based academies in Africa as effective civil society organisations and respected sources of evidence-based advice; and build stronger, sustained linkages amongst scientists in Africa and around the world, and with policymakers and key influencers.

Through this project, senior and young academies made a proactive contribution towards facilitating the national implementation of the UN SDGs and AU Science, Technology and Innovation Strategy 2024 (STISA-2024). The voice of underrepresented research communities was strengthened through their academies, and examples of good practice were shared, developed and scaled up. In addition, young African scientists received policy training while supporting African policy institutions (described in more detail below), and African academies built capacity for sustained follow-up work.

The project seeded the foundations to achieve these outcomes by informing academies on policy processes and providing ideas for ways in which they can engage, at the continental and national levels.

IAP worked in collaboration with Future Africa and the GYA to develop the *Africa Science Advice for Policy* Leadership Development Programme. The component workshop and fellowships of this programme, implemented in March–June 2019, were designed to support the professional development of emerging early-to-mid-career African researchers passionate about science serving society. A two-day science policy and leadership workshop was hosted by the new Future Africa Institute in March 2019. The workshop included 35 emerging leaders from 14 African countries interested in working in, or learning how to influence science policy. Thirteen African scientists were hosted by African policy institutions for 4-6 week fellowships, which allowed them to put these skills into practice.

The final project report was launched at the NASAC Board meeting and Academy of Science of South Africa (ASSAf) policy workshop on SDG#6 (Water) in Pretoria, South Africa, in July 2019. It provides recommendations for UN and AU systems, their agencies and funders, IAP, the Network of African Science Academies (NASAC) and national member academies, GYA and national young academies in Africa, the African Academy of Sciences (AAS) and the ISC Regional Office for Africa.

IAP members are encouraged to continue to apply the learning from these projects to their ongoing efforts to bring science to society (for any inquiries, please contact the secretariat at projects@iapartnership.org). ■

Participants of the Africa Science Advice for Policy Leadership workshop.

Promoting Global Health

Health is a cross-cutting issue that is deeply entrenched in every aspect of modern society, from urbanisation and sustainable development to human rights. Recognising this as a pivotal issue in today's society, IAP promotes health around the globe by working with expertise in its medical and other academies, as well as through interdisciplinary approaches.

Jorgen Neira, member of the *Academia Nacional de Medicina*, and Detlev Ganten, Founding President of the World Health Summit, meet some medicine students after the launch of the IAP Statement in Kish Island, Iran.

Trauma is a Disease

Every year injuries kill more than 5 million – they are the cause of death for around 1 out of every 10 people. Injuries have also been considered the number one killer and crippler of children for more than 20 years, yet in most countries acute injuries (also known as trauma) are still considered 'accidents'. Labelled as accidents, they are not addressed by an integrated and comprehensive approach in most national healthcare systems.

Drawing attention to the need for a strong paradigm shift, the IAP Statement 'A Call for Action to Declare Trauma as a Disease' encourages countries not only to control but also to prevent trauma by considering it as a disease with an integrated comprehensive approach in their health agenda.

"Vehicle crash, homicide, fall, drowning: when reported, trauma is still described by category. In contrast, while there are many types of cancer, healthcare systems have unified their prevention and control strategies – and rightly so, as this has been proven very effective. It is time for all countries to make a similar transition and declare trauma as a disease," explained Jorge Neira of the *Academia Nacional de Medicina* (Argentina) who co-chaired the working group responsible for developing the statement.

Audience at the launch of the IAP Statement 'A Call for Action to Declare Trauma as a Disease' at the World Health Summit Regionl Meeting in Kish Island, Iran.

The statement aims to build on the successes of countries such as Canada, Germany and the USA that have significantly reduced deaths and disability from trauma by focusing on acute injury as an integral, inclusive and undivided entity.

The statement was released in April 2019 during the 7th World Health Summit (WHS) Regional Meeting in Kish Island, Iran.

Urban Health

The WHS Regional Meeting hosted a 'Healthy Cities' panel co-chaired by Jo Boufford, coordinator of the IAP Urban Health Working Group. Panellists discussed how healthy cities can help to achieve the Sustainable Development Goals (SDGs), such as SDG#2 (Zero hunger), SDG#6 (Clean water and sanitation), SDG#11 (Sustainable cities and communities), SDG#13 (Climate action), and SDG#16 (Peace, justice and strong institutions).

A short video recorded at this IAP session kicked off a series of urban health videos (available on the new IAP Youtube Channel at https://tinyurl.com/IAPuhplaylist) that feature members of the IAP Urban Health Working Group. In one video, Paulo Saldiva, Professor of Pathology at the Faculty of Medicine at the University of São Paulo, explains how urban living affects human health, suggesting that there is an urban biology underlying the pathogenesis of human diseases. In another, Zama Kunene, a scientist at the South African Medical Research Council (MRC) who works in collaboration with the Academy of Science of South Africa (ASSAf) Urban Health Working Group, explains how urban health can improve the lives of those who are most affected by climate change.

Epidemic Preparedness and Response

The UK Academy of Medical Sciences (AMS), IAP and the UK Medical Research Council (MRC) convened a policy workshop on 'Multidisciplinary Research in Epidemic Preparedness and Response' on 2-3 October 2019 in London, UK. The two-day event stimulated thinking around the vital research evidence required to better prepare, prevent and respond to epidemics, particularly where these arise in poorly resourced countries.

Jo Boufford, coordinator of the IAP Urban Health Working Group, on the stage of the 2019 Regional World Health Summit.

It was the fifth workshop organised by AMS in partnership with IAP using funds held by the AMS from the UK's Global Challenges Research Fund (GCRF), each of which has resulted in the publication of a report with advice and recommendations for policymakers. The inclusion of MRC among the partners for this workshop allowed this event to be larger than previous ones, gathering 83 participants from 29 countries across Africa, Asia and Latin America.

A sixth workshop organised by AMS in partnership with IAP focused on 'Addressing the social determinants of global mental health in the Sustainable Development Goals era'. The workshop was held in London on 31 October – 1 November 2019. Reports of deliberations, with recommendations for policymakers, for both these workshops will be published in early 2020.

Climate Change and Health

Extreme heat, natural disasters and waterborne and infectious diseases are just some of the effects of climate change that put human health at risk.

According to the World Health Organization (WHO), between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year from heat stress, malaria, diarrhoea and malnutrition alone. Regions with weak health infrastructure such as developing countries will be the least able to cope, but the climate crisis will put stress on health systems worldwide. Nevertheless, the evidence base of the effects of climate change on human health is still fragmented and, until recently, policymakers have tended to neglect this looming public health emergency.

"This must change: we need robust scientific evidence to guide policy, assess the effectiveness of current commitments, and protect health around the world. We owe that to future generations," said Volker ter Meulen, IAP President, presenting IAP's 'Climate Change and Health' project launched in November 2019.

Building on work on climate change and health in Europe by the European Academies' Science Advisory Council (EASAC), the project will produce regional reports for Africa, Asia and the Americas that will provide a snapshot of the current situation and present science-based recommendations for each region. An additional global synthesis report will highlight regional similarities and differences across all four regions, and provide advice for decision makers for implementation at global, regional and national levels. Recommendations will take into account local circumstances and strategic needs, including responding to and recovering from the COVID-19 pandemic.

The German National Academy of Sciences, *Leopoldina*, is leading this IAP project with financial support from the German Federal Ministry of Education and Research (BMBF). The project runs from October 2019 to December 2022, and is co-chaired by Volker ter Meulen and Andy Haines of the London School of Hygiene and Tropical Medicine, a leading expert on the relationship between climate change and health.

Experts and representatives of IAP's four affiliated regional networks of academies – AASSA (Asia), EASAC (Europe), IANAS (the Americas) and NASAC (Africa) – convened in Halle, Germany, on 4-5 November 2019 for the first project meeting. In Halle, participants shared their regional perspectives. They also discussed the project design and roadmap, and agreed that the focus of the project should be on climate change

Participants to the policy workshop 'Multidisciplinary research in epidemic preparedness and response' organised by the Academy of Medical Sciences (AMS), the InterAcademy Partnership (IAP), and the Medical Research Council (MRC).

adaptation and mitigation strategies that bring health co-benefits.

In the next phase, each network will form a regional expert group of outstanding scientists, policymakers and practitioners nominated by IAP member academies. Each regional network will also organise a workshop which will draw together broader scientific and health expertise to sharpen the regional focus of each report. In subsequent meetings, these experts will prepare their regional analysis and formulate evidence-based recommendations.

The regional reports from NASAC, AASSA and IANAS (together with any updated EASAC material) will be published and launched in 2021, and will then be used to engage with regional

Robin Fears presenting on 'Climate Change and Health' at the World Health Summit in Berlin, Germany. Photo courtesy of the World Health Summit.

policymakers, the scientific community and other stakeholders. The global synthesis report will be ready in 2022, and will be presented to the World Health Organization (WHO) and other global and regional stakeholders.

World Health Summit

The 2019 edition of the World Health Summit, one of the world's leading strategic forums for global health, took place in Berlin, Germany, from 27-29 October. Some 2,500 participants from 100 countries took part in the summit and, for three days and 50 sessions, over 300 speakers presented their strategies for global healthcare and called for collaborative solutions for improving health worldwide.

The M8 Alliance of Academic Health Centres, Universities and National Academies is the academic think-tank behind the WHS, and includes IAP among its membership.

The 2019 WHS welcomed a cohort of 24 new IAP Young Physician Leaders (YPLs - see pages 25-27), who participated in the tailored workshop on leadership that, since 2011, has provided 188 outstanding young health professionals with the skills they need to promote health and strengthen health systems in their countries.

Furthermore, IAP presented three sessions: 'Respect and Dialogue' used health as an entry point to explore barriers – between sectors, disciplines and cultures – and how they can be overcome to achieve progress towards the SDGs; while 'Climate Change and Health' discussed key points relating to the impacts of climate change for health, stimulated by EASAC's recent work with particular regard to identifying policy needs and actions and by the IAP project that aims to extend academies' analysis worldwide. In addition, the 2019 cohort of YPLs collectively developed and presented the session: 'The Leadership We Want'. ■

Science Education and Science Literacy

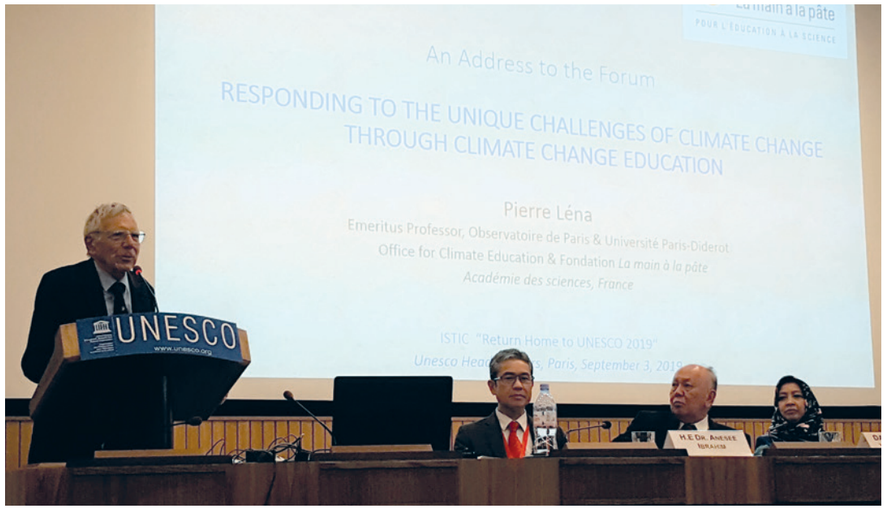
IAP seeks to reform and develop science education on a global scale, especially in primary and secondary schools, with a pedagogy based on Inquiry-based Science Education (IBSE). The IAP Science Education Programme (SEP) is led by a Global Council of experts that defines and implements its annual activities on global and regional scales.

Science Literacy

Members of the IAP SEP's Global Council convened in Bangkok, Thailand, to hold their annual meeting. Taking advantage of the presence of the IAP experts, the hosts, the National Science Museum (NSM) of Thailand, also organised a 'Policy Forum on Science Literacy: Roles of science museums and science centres'.

Featuring 16 speakers from 13 countries, the Policy Forum included discussions of the role of science museums in raising public science literacy. In particular, it was noted that most African countries lack a science museum or science centre. In response, it was proposed that IAP member academies, especially those in Africa, should promote the creation of science centres in their countries.

The 'Innovative Forum for ASEAN Museums towards Achieving Science and SDG Awareness in the Community' was held on 18-19 August 2019 at the National Science and Technology Fair 2019 in Thailand.



Pierre Lena, member of the *Academie des sciences* and co-founder of *La main à la pâte* (LAMAP), at UNESCO.

This theme was also the focus of the Global Council meeting that followed the conference, where it was decided to link the creation of science centres and museums in Africa with the ongoing IAP Centres for Education in Science in Africa, the Mediterranean and Europe (CESAME) initiative.

At the close of the Global Council meeting, Wafa Skalli of Morocco was affirmed as the new chair of the Global Council, with her academy, the Hassan II Academy of Science and Technology, taking over as the lead academy.

Young Scientists and National Museums

The 'Innovative Forum for ASEAN Museums towards Achieving Science and SDG Awareness in the Community' also took place during the Thai National Science and Technology Fair. The forum was jointly organised by the NSM, the Thai Academy of Science and Technology (TAST) and the Thai Young Scientists Academy (TYSA). The event was jointly funded by IAP and NSM and was held on 18-19 August 2019, immediately prior to the IAP Policy Forum (above). The forum convened eleven young scientists and ten museum representatives from all ten ASEAN Member States. Participants discussed different approaches to integrate science and technology as well as the UN Sustainable Development Agenda into museums in ASEAN countries in order to promote a culture of science in society.

Discussions were followed by a workshop where creative problem solving tools were used to develop solutions and implementable plans to tackle local and regional challenges. In summary, the workshop provided the first stepping-stone for young scientists to work in collaboration with national museums and to begin to build cooperative approaches for a wider impact.

Following the presentation of the outcomes of this event to the IAP SEP Global Council (above), the young scientists were encouraged to expand their engagement with local science museums and science centres, while the Global Young Academy (GYA) was called on to harness the energy and expertise of its members, including in other regions.

Climate Education

Launched in 2008, the International Science, Technology and Innovation Centre for South-South Cooperation under the auspices of UNESCO (ISTIC) is hosted by Malaysia. Every two years, it organises an event at UNESCO's headquarters in Paris where it reports on its key activities to heads of delegations. In 2019, the ISTIC 'Return Home to UNESCO' took place on 3-5 September, with the associated forum 'Responding to the Unique Challenges of Climate Change through Climate Change Education' on 3 September.

A number of resources and activities for teachers in the area of climate change education were presented, including an increasing number being produced by the Paris-based Office for Climate Education (OCE) that are designed to relate to outputs of the Intergovernmental Panel on Climate Change (IPCC) and include topics such as 'Oceans and climate change' and 'The greenhouse effect'.

The IAP Statement on 'Climate Change and Education', along with companion workshops

The inauguration of the IAP SEP-supported 'Third Belt and Road Teenager Maker Camp and Teacher Workshop' in Nanning, China. This IAP SEP-supported event took place from 24-30 September 2019.

organised around the globe – including one held by ISTIC in Malaysia in 2018 – that are taking forward the recommendations of the statement were also presented, as well as the 'Mosquito!' teaching curriculum prepared by the Smithsonian Science Education Center in collaboration with IAP.

Teenager Maker Camp and Teacher Workshop

The 'Third Belt and Road Teenager Maker Camp & Teacher Workshop' that took place in Nanning, China, from 24-30 September 2019, aimed to strengthen cross-cultural exchange, promote international understanding, and inspire innovation in the younger generation.

The Camp was hosted by the Ministry of Science and Technology, People's Republic of China (MOST), the China Association for Science & Technology (CAST) and the People's Government of Guangxi Zhuang Autonomous Region. It was organised by the Children & Youth Science Centre (CYSC) of CAST, the People's Government of Guangxi Zhuang Autonomous Region and Guangxi Association for Science and Technology (GAST), and supported by IAP SEP, the ECO Science Foundation (ECOSF), and the Network of African Science Academies (NASAC).

"As a scientist, I believe the second theme of this Belt and Road Teenager Maker Camp, 'Innovation for Development', is especially relevant – and also especially relevant for Science Education," said IAP President Depei Liu in his welcome speech.

Liu stressed the fact that inquiry-based science education (IBSE) is the innovation that can improve not only science education, but education in general.

Teams of students, teachers, entrepreneurs and officials from 33 countries and regions joined the event. Among them, thanks to NASAC, were student and teacher representatives from four African countries. During the event, participants were divided into groups and competed to develop hands-on scientific projects, which were judged by a panel of experts – with the best teams receiving prizes and medals at the close of the event. ■

Supporting Young Scientists and Physicians

One of the aims of IAP is to strengthen the global scientific enterprise. A key component of this is supporting the careers of young scientists and assisting them to engage with policy-makers, and providing leadership training for Young Physician Leaders (YPL) as part of efforts to strengthen healthcare systems around the globe. The election of the Global Young Academy (GYA) as a new member of IAP will go a long way to supporting this work.

Worldwide Meeting of Young Academies

Representatives from more than 30 young academies from around the globe met for the Fourth Worldwide Meeting of Young Academies at Duy Tan University in Da Nang, Vietnam. This IAP-supported meeting, which explored the theme 'Young Academies for Promoting Peaceful and Inclusive Societies', took place from 31 July - 2 August 2019 and was hosted by the Vietnam Young Academy (VYA) and co-organised by the Global Young Academy (GYA).

Flavia Schlegel, the Special Envoy for Science in Global Policy at the International Science Council (ISC), opened the meeting with a keynote address on the role of young academies in providing science advice as intermediaries between the research community and policy-makers nationally and globally. This set the tone for discussions on how young academies can better engage in the implementation and development of the United Nations Sustainable Development Goals (SDGs). Discussions were built on the 2017 young academies' statement on the UN SDGs and also drew on IAP's report on 'Improving Scientific Input to Global Policy-making' (see pages 16-17), which lists specific recommendations for action by young academies.

Meeting participants also exchanged best practices on science advice, outreach and communication; discussed how to deal with declining levels of academic freedom and trust in science; and reviewed existing activities for at-risk and refugee scholars. Time was also provided for the discussion of some internal matters common to young academies, including membership selection criteria and procedures, fundraising strategies and engaging with young scientists in the diaspora.

Young Physician Leaders

The 2019 edition of the IAP Young Physician Leaders (YPL) programme took place on 24-29 October 2019 in Berlin, Germany. 24 physicians below the age of 40 from 21 countries joined the programme and reached the German capital not only to attend a tailored leadership training workshop, but also the World Health Summit (WHS), a high-level international forum for global health.

"This programme identifies and convenes a diverse group of outstanding early career physicians from multiple specialties and career interests – education, clinical practice, public health and health policy and research – who are committed to being change agents for health in their countries. They come from all regions of the world and diverse societies at very different stages in their economic development," said Jo Boufford, YPL Project Coordinator.

Participants were chosen by a committee of medical and scientific professionals, who reviewed the nominations received from IAP member academies and members of the M8 Alliance, a network of 25 leading international academic health centres, universities and research institutions.

The 2019 IAP Young Physician Leaders cohort.

"Effective health care and health policy leadership need effective leaders, but many young professionals have to learn their leadership skills almost by trial and error as too few countries are actually providing the necessary training. The IAP YPL programme fills this gap," explained Peggy Hamburg, IAP Health co-chair.

"The IAP YPLs will engage in peer-to-peer learning and join a network with whom to continue to share experiences and exchange best practices after the workshop," added Depei Liu, IAP President and IAP Health co-chair.

During the workshop itself, participants explored the sources of leadership in an interactive session based on a case study, and became aware of the different leadership styles a leader needs to know in order to collaborate with superiors, peers and followers. They also identified their own prevailing leadership style, delved into the complex processes of decision making, discussed their own leadership challenges in peer-to-peer group consultations, and had brainstorming sessions to prepare their own session to be presented at the WHS. Moreover, they visited the Bayer Science and Education Foundation to take part in an interactive workshop on 'Leading to Solutions', and joined Siemens Healthineers and Flying Health for a roundtable on 'The Potential of Digitization in the Hospital Sector'.

"To achieve something that is substantial we need diversity, because it will allow us to consider varied perspectives, promote respect, build critical thinking and also allow us to deal with conflict," summed up Jaifred Christian Lopez, a YPL nominated by the National Academy of Science and Technology, Philippines.

"We should be the leaders that we want to be in the future, and I believe that we, as Young Physician Leaders in healthcare, have a lot to contribute," he added.

The 24 YPLs of 2019 subsequently joined a network of 188 alumni from more than 50 countries, bringing the total to 212. The network aims to enable further communication between members of the group and facilitate information exchange and collaboration.

The YPL programme is organised by IAP in collaboration with the European School of Management and Technology (ESMT Berlin) and supported by the Tides Foundation, Charité – Universitätsmedizin Berlin and the Bayer Science & Education Foundation, with (in 2019) additional support from Siemens Healthineers.

In 2019, the work of some YPL alumni has been featured on the IAP website, including news dedicated to '*Aidants, ces invisibles*', the new book of Hélène Rossinot (France) and about a Forbes article that features Edsel Salvana (Philippines), who was spotted during Infectious Diseases Week dressed up as plague doctor in order to call attention to polio and measles outbreaks in the Philippines.

At the World Science Forum

The World Science Forum (WSF) on the theme 'Science, Ethics and Responsibility' was hosted in Budapest by the Hungarian Academy of Sciences on 20-23 November 2019.

However, IAP and the GYA kick-started their engagement with the event on 19 November by hosting a Science Leadership Workshop. The activity was attended by 43 excellent young scientists from around the world, who were invited to Budapest to discuss ethics in science, learn skills and creative approaches to solve problems, and discuss effective science communication. Participants also collaborated on producing an 'S.O.S. Booklet for Global Young Scholars', a publication that will be released in 2020.

The WSF also saw the launch of the 'Declaration on the Guiding Principles of Young Academies', a direct outcome of the Fourth Worldwide Meeting of Young Academies in July 2019. With the GYA's support, the network of young academies continues to grow, from just a handful in 2014 to currently more than 40 across all global regions. ■

Biosecurity and Responsible Research

The IAP General Assembly agreed to establish a Biosecurity Working Group in 2003. Its activities include working with the Biological and Toxin Weapons Convention (BWC), as well as the promotion of responsible research practices, including through collaboration with the Organisation for the Prohibition if Chemical Weapons (OPCW).

The Biological and Toxin Weapons Convention

As in previous years, in 2019 IAP participated in the Meeting of Experts of the Biological and Toxin Weapons Convention (BWC), which ran from 31 July to 2 August, and organised events in collaboration with the US National Academies of Science, Medicine and Engineering (NASEM).

On 1 August, IAP and NASEM hosted a workshop on 'Frameworks for Assessing the Risks and Benefits of Advances in Science and Technology: An experts meeting to inform the States Parties of the Biological and Toxin Weapons Convention', with more than 25 invited experts from some 20 countries. Yuri Nikolaichek (Belarus), one of the Chairs of the BWC Meeting of Experts attended the workshop's opening session. The aim of the meeting was to examine and test how a 'framework' and a 'decision tree' might be used to assess the potential risks associated with two hypothetical, but realistic, biotechnology research case examples.

Participants of the IAP-NASEM workshop on 'Frameworks for Assessing the Risks and Benefits of Advances in Science and Technology: An experts meeting to inform the States Parties of the Biological and Toxin Weapons Convention'.

Participants of the OPWC-IAP-TWAS workshop explored the dual-use technologies and responsible research practices in chemical and biological sciences.

Through thought experiments undertaken by two parallel expert break-out groups, both groups came to similar conclusions regarding the risks associated with each scenario, independent of which method was used to assess the implications of the hypothetical research. Participants agreed, therefore, that both the framework and the decision tree could be useful tools for the BWC States Parties, either individually at the national level, or collectively at the international level, to assess the risks of emerging biotechnologies. In a separate session, participants also discussed how to design a framework to assess the potential benefits of any such research, with the aim of aiding any decision-making process for comparing risks and benefits.

These workshop outcomes were presented to the BWC the following day: first during a side event organised by IAP and NASEM that was attended by some 60 participants, including representatives of the national delegations of India, the UK and the USA, and subsequently in the plenary session of the States Parties. Questions raised by delegates of the States Parties included the possibility of assessing risks and benefits simultaneously, how such frameworks could work at the national or regional level, and the involvement of industry experts in working groups to assess risks. Such issues will be taken forward by IAP and NASEM as work in this area progresses.

Later in the year, on 4 December, the BWC Meeting of States Parties took place, again in Geneva, Switzerland. On this occasion, IAP and NASEM organised another side event to mark the release of the summary report of the qualitative frameworks exercise and discuss ways in which such frameworks could support the BWC.

Early-career Scientists

A select group of early-career scientists from around the world convened in Trieste, Italy, from 9-13 September 2019 for a workshop that explored dual-use technologies and responsible research practices in chemical and biological sciences. The workshop, managed by the Organisation for the Prohibition of Chemical Weapons (OPCW), IAP, and The World Academy of Sciences (TWAS), was attended by more than 40 participants and speakers from 25 countries, including 20 developing nations.

The workshop had three objectives: to seek advice and solutions from scientists on issues related to safety and security; to disseminate the culture of responsibility and ethics and inform scientists about any possible issue related to their work; and to raise awareness among scientists about policy and their potential proactive role in policymaking.

In many countries, science students and early-career researchers are not routinely exposed to the issues of dual-use research, while faculty reported that they rarely taught the subject. Working with OPCW and TWAS in hosting such

A session of the IAP-NASEM side event at the Biological and Toxin Weapons Convention Meeting of States Parties.

workshops (this was the third in a series) is part of IAP's effort to raise awareness among young scientists of responsible research practices and the potential harmful uses of research that need to be avoided.

Microbial Threats in the Arctic

NASEM, together with the European Academies' Science Advisory Council (EASAC) and IAP, convened a workshop on 'Arctic warming and microbial threats' in Herrenhausen, Germany, on 6-7 November 2019, with support from the Volkswagen Foundation. The event brought together an interdisciplinary, international group of researchers and public health officials to explore what is known and what critical knowledge gaps remain regarding existing and possible future risks of harmful infectious agents emerging from thawing permafrost and ice in the Arctic region.

The workshop explored case studies of known, observed risks, such as the Arctic region anthrax outbreaks, and analysed other types of human and animal microbial health risks that have been discovered in snow/ice/permafrost environments or that could conceivably exist (e.g., smallpox and influenza). It also investigated key research needs, including critical tools for improving observation and surveillance to advance our understanding of these risks and aid in facilitating and implementing effective early warning. Furthermore, it offered a chance to discuss collaboration opportunities, especially to facilitate cooperation on such efforts, building, wherever possible, upon existing programmes and platforms.

The proceedings workshop will be published by IAP in 2020.

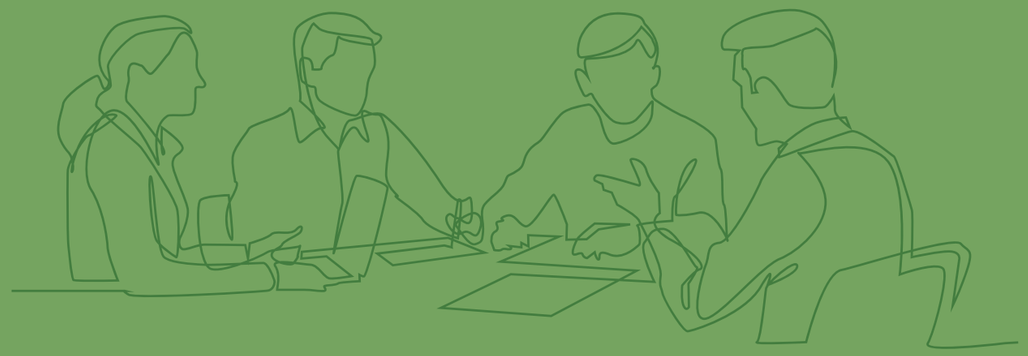
World Science Forum

Celebrating the 20th anniversary of the 1999 World Conference of Science, the World Science Forum (WSF) returned to Budapest to be hosted by the Hungarian Academy of Sciences under the theme 'Science, Ethics and Responsibility'. At the November 2019 event, IAP joined with the Royal Scientific Society, Jordan (RSS) to organise a session on 'Science for Peace: Successes and Future Responsibilities'.

Speakers included Nurcan Meral Ozel (Comprehensive Nuclear Test-Ban Treaty Organization, CTBTO), Jonathan Forman (Organisation for the Prohibition of Chemical Weapons, OPCW), Indira Nath (Indian National Science Academy), Flavia Schlegel (International Science Council, ISC) and Tolu Oni (former co-chair of the Global Young Academy, GYA).

Discussions revolved around the ethical responsibilities of scientists and science policy – from the individual in the laboratory to the global scale. It was noted that research ethics have largely failed to keep pace with recent rapid scientific developments. Areas of concern include, for example, artificial intelligence and synthetic biology. There is a need to set up systems for global participation to discuss emerging technologies, to incentivise good ethical practices by industries and institutions, and for global harmonisation and robust governance, argued Nath; while Schlegel noted that the scientific community has the responsibility of showing that multilateral systems can work and that they do provide concrete answers to current challenges to peace. ■

Regional Activities



Association of Academies and Societies of Science in Asia (AASSA)

The Association of Academies and Societies of Science in Asia (AASSA), with the support and leadership of IAP, has been actively working to enhance collaboration and cooperation among academies, societies and scientists in Asia and Oceania. Since its inauguration in 2012, the Secretariat has been hosted by the Korean Academy of Science and Technology (KAST).

AASSA serves as a forum to discuss and to offer advice on issues related to science and technology, research and development, and the application of technology for socio-economic advancement. The principal objective of AASSA is to act as an organisation in Asia and Oceania which contributes to the development of the region through science and technology. The current membership stands at 32 national academies and societies of sciences from 30 countries and one regional academy of engineering and technology.

AASSA Executive Board Meeting

The Executive Board Meeting of AASSA was held on 23-24 September in Seoul, Korea. At the meeting, participants agreed on the organisation's 'Strategic Objectives and Implementation Plan'. To fulfil its mission, AASSA focuses on five major strategic objectives: Sustainable Development in Asia (SDA); Science Education in Asia and Oceania; Women in Science, Technology, and Innovation; Science, Health, Agriculture, Risk and Environment (SHARE) Communication; and Economic and Social Advancement through Science, Technology and Innovation.

AASSA works to accomplish and achieve its objectives by strengthening science-based policy advising capacity; recruiting new academy members; building the capacity of weak or inactive members; and encouraging the participation of young scientists in AASSA activities.

At the meeting, delegates agreed to launch the new Committee on Science Education and a Committee on Sustainability that will work alongside the already established SHARE Committee and the Women in Science and Engineering (WISE) Committee.

Regional Workshops

In 2019, in collaboration with its members, AASSA organised four regional workshops covering a range of topics pertinent to the region and to implement Sustainable Development Goals (SDGs) such as SDG#2 (Zero Hunger), SDG#3 (Good Health and Well-being), SDG#9 (Industries, Innovation and Infrastructure), SDG#11 (Sustainable Cities and Communities), and SDG#17 (Partnerships for the Goals).

Communicating Science and Countering Misinformation

Facing the new challenges of science communication, AASSA believes it is imperative to prevent the spread of paid and fake news and propaganda, and that the scientific community needs to discuss these issues taking into account of both the practical and ethical dimensions. The spread of misinformation has adverse repercussions among all stakeholders, including researchers, scientists, science communicators, policy-makers and the general public.

To share, discuss, brainstorm and find solutions, AASSA, the Indian National Science Academy (INSA), and CSIR-National Institute of Science Communication and Information Resources (NISCAIR) jointly organised a Regional Workshop on 'Science Breakthrough: Paid News, Fake News and Ethics' on 20-22 February 2019 in New Delhi, India. About 50 experts, including science communicators, policymakers and scientists from seven Asian countries – China, India, Indonesia, Nepal, South Korea, Thailand and Vietnam – participated in the workshop.

The workshop concluded with participants agreeing to the adoption of a series of ten recommendations which were subsequently communicated to AASSA member academies and other stakeholders. Among these recommendations was a call for more research into the damage caused by fake science-related news. Also, that there is an important role of science academies in communicating scientific developments to the public, especially children, as well as to promote stronger networking between different stakeholders, including scientists and the media.

Group photo at the Executive Board Meeting of AASSA in Seoul, Korea.

Urbanisation in Asia

Most industrialised or industrialising countries have experienced both economic growth and urbanisation. Urban population growth has occurred mainly through rural-to-urban migration, and from 2007, more than half of the global population has been living in cities.

Urbanisation and its consequences are especially relevant in low- and middle-income countries. With the aim of examining the status of urbanisation in Asian countries and to prepare an analysis of major problems and their policy implications, the National Academy of Science of Sri Lanka (NASSL) organised a Regional Workshop on 'Managing Urbanisation in Asia' jointly with AASSA and with financial support from IAP. On 25-26 June 2019, 40 international and national experts, including young planners, convened in Colombo, Sri Lanka. These experts analysed the current status of urbanisation and industrialisation and developed a set of recommendations to promote sustainable urbanisation, including reforming national state policies, ideally safeguarded by constitutional reforms, to promote planned urbanisation rather than ad hoc planning. Participants also urged the use of science-based approaches in urban planning aligned with the SDGs, inc-

luding a consideration of the health and wellbeing of urban populations.

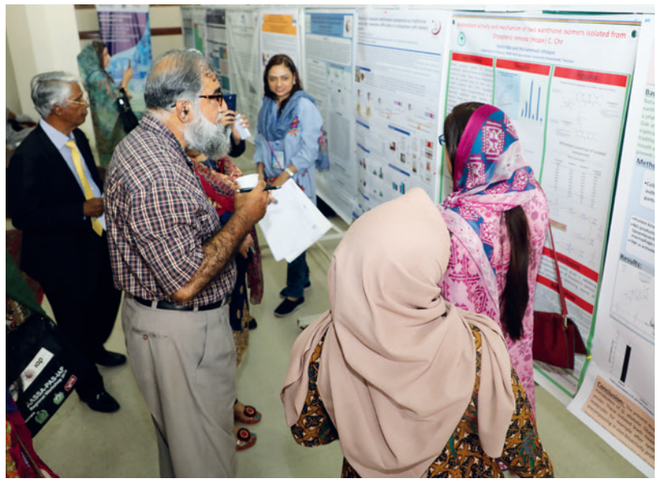
Complementary Medicine

In order to shed light on the role of medicinal plants and complementary medicine in treating patients and to formulate new strategies, a Regional Workshop on 'Complementary Medicine as an Answer to Challenges Faced in Achieving Sustainable Goals in Health' was organised jointly by the Pakistan Academy of Sciences (PAS) and AASSA on 19-21 August 2019 in Islamabad, Pakistan. Discussions during the workshop covered topics such as complementary medicine and the SDGs; media and alternative medicine; land tenure and sustainable use of medicinal plants; and role of practitioners in maximising benefits of herbal medicine. Lectures were presented by three international experts together with 11 from Pakistan. A special poster session also allowed invited young scientists to showcase their work.

The workshop concluded with the adoption of a set of 12 recommendations, including a call for existing regulations to strengthen safety, quality and effectiveness of traditional and complementary medical therapies and practices to be reviewed and revised. In addition, participants urged that suppliers of medicines based on natural products must ensure that harvesting of the products is done sustainably if taken from wild populations, or that the source organism is domesticated to meet demands. Finally, efforts must be made to eliminate illegal trade in endangered species targeted for their supposed health benefits. Such efforts should include an awareness campaign about the lack of a scientific basis for any medical benefit of such products as rhinoceros horn or pangolin scales.

Sustainable Agriculture

The continuing increase of the global population, combined with rapid industrialisation in developing countries, puts global food and energy supplies under great strain. For these reasons, an understanding of how and to what extent climate change may affect agricultural productivity is pivotal to designing ways to adapt to the impacts of climate change. One such adaptation would be to promote the use of new industrial crop varieties grown on marginal land. The Korean Academy of Sciences and Technology (KAST) and AASSA, therefore, collaborated to organise a Regional Workshop on 'Crop Biotechnology for Sustainable Agriculture' on



The poster competition at the AASSA-PAS Regional Workshop in Islamabad, Pakistan.

23-24 September 2019 in Seoul, Korea. The aim of the workshop was to strengthen research in the fields of crop biotechnology on agriculture production, human health and social security; to increase international collaborations among scientists and experts to develop reliable and environmentally sustainable approaches for agriculture; and to formulate recommendations that may be submitted to concerned institutions and agencies both in Asia and other regions to eventually provide high quality and evidence-based science advice.

Subsequently, the workshop was highlighted in an editorial and nine of the presentations were published in the international electronic journal Plant Biotechnology Reports. In addition, a series of six recommendations were adopted by participants and communicated to AASSA member academies and other interested parties.

AASSA President's Young Scientist Awards

To encourage and nurture young scientists, AASSA recognized the work of one promising young scientist at the 41st Annual Scientific Meeting of the National Academy of Science and Technology in Manila, Philippines (11 July 2019), and six young scientists at the AASSA-PAS Workshop on 'Complementary Medicine as an Answer to Challenges Faced in Achieving Sustainable Goals in Health' in Islamabad, Pakistan (20 August 2019). ■

European Academies' Science Advisory Council (EASAC)

EASAC is IAP's regional academy network for Europe, consisting of 28 national science academies from the 25 European Union Member States plus Norway, Switzerland and the UK. The pan-European academy *Academia Europaea* and the association of all academies in geographical Europe, ALLEA, are represented in EASAC's governing body, the Council. The Federation of European Academies of Medicine (FEAM) has observer status at the Council.

European Academies easac Science Advisory Council

EASAC was established in 2001 to provide 'science for policy' in Europe, with a particular focus on policy makers and opinion formers in the institutions of the European Union (EU). The EU is the dominant political body in Europe, of key importance not only to Member States, but also to its neighbouring countries.

During 2019, EASAC's 'science for policy' work gained good visibility at the EU level as well as traction in relevant scientific literature, with article publications in several high impact journals.

The launch of the EASAC report on 'Decarbonisation of Transport' in Brussels, Belgium, on 20 March 2019.

Highlights

2019 saw the publication of three substantial 'science for policy' documents by EASAC: a report on the decarbonisation of transport, a report on climate change and health, and a

Discussion of the EASAC report on 'Climate Change and Health' at the European Parliament on 1 October 2019. The co-chairs of the EASAC working group on on 'Climate Change and Health', Andy Haines and Volker ter Meulen, and the EASAC Programme Director, Robin Fears, are sitting on the left side of the stage.

statement (together with FEAM) on traditional Chinese medicine. Furthermore, EASAC delivered crucial follow-up work to science-based advice delivered in previous years, in particular based on the 'Food and Nutrition Security and Agriculture' and 'Forest Bioenergy' projects. As well as the reports, nine articles were published in various high-impact journals such as *The Lancet* and *Nature*. Beyond this, EASAC held its usual two General Assemblies (Council) and four Presidium (Bureau) meetings per year, as well as five meetings of its three Steering Panels, and six working group meetings of three different projects. Last but not least, EASAC supported the planning for the World Science Forum (held in Budapest, Hungary, in November 2019) and contributed five scientific sessions.

In 2019, the Cyprus Academy of Science, Letters and Arts, just founded in 2018, became the newest EASAC member.

Reports and Statements

Decarbonisation of transport

EASAC published its report 'Decarbonisation of Transport: Challenges and opportunities' (DoT) in March 2019. The Brussels launch event assembled a number of influential policy-makers of the European Commission and Parliament, notably MEP Claude Turmes, a leading voice for European energy transition. In early April, the Swiss Academies of Arts and Sciences hosted an event in Berne, Switzerland, to discuss the recommendations of the report with the wider public, led by Konstantinos Boulouchos of the ETH Zurich, the Chair of the DoT working group. The findings of the report were subsequently communicated in a number of ways to further European policy-makers and opinion-formers.

Climate change and health

The EASAC report on climate change and health, 'The Imperative of Climate Action to Protect Human Health in Europe', was published in June 2019 and received a lot of attention in Europe and elsewhere. EASAC teamed up with the European Parliament's Research Service to organise a discussion event on the findings and recommendations of the report, held at the Library of the European Parliament in Brussels, Belgium, at the beginning of October. The report was presented by the working group co-chairs Andy Haines (UK) and Volker ter Meulen (Germany), and the EASAC Biosciences Programme Director, Robin Fears. Furthermore, in 2019, EASAC actively contributed to the creation of the new global IAP project on 'Climate Change and Health' (see pages 20-21) that has received funding from the German Federal Minstry of of Education and Research (BMBF) and engages the other three IAP regional networks.

Traditional Chinese medicine

The joint statement by EASAC and FEAM on 'Traditional Chinese Medicine' (TCM), published in November 2019, was reported widely in European and global media, with reports published in *The Economist*, *The Guardian*, *L'Obs*, *Dagens Nyheter*, *South China Morning Post* and *Deutschlandfunk* among others. In this publication, the two organisations comment on the move by the World Health Organization (WHO) to list TCM as a medical treatment alongside evidence-based therapies. This statement was

The EASAC Council Meeting Helsinki, Finland.

an opportunity to engage with new and different audiences on the importance of evidence for public policies.

Publications in Scientific Journals

Publishing the outcome of EASAC's reports in peer-reviewed, high-impact factor journals can lend credibility and give greater visibility to the policy recommendations that have been developed. EASAC's recommendations were discussed in the following contributions to scientific journals in 2019: 'Global food and nutrition security needs more and new science', *Science Advances* (Dec 2019); 'Globalization of Traditional Chinese Medicine: what are the issues for ensuring evidence-based diagnosis and therapy?', *Journal of Internal Medicine* (Nov 2019); 'Urgent action is needed to protect human health from the increasing effects of climate change', *The Lancet Planetary Health* (Aug 2019); 'Serious mismatches continue between science and policy in forest bioenergy', *Global Change Biology – Bioenergy* (Aug 2019); 'Win–wins for health and climate', *Nature* (July 2019); 'Scientific opportunities for nutrition security', *The Lancet Correspondence* (June 2019); 'Food systems for delivering nutritious and sustainable diets: Perspectives from the global network of science academies', *Global Food Security* (June 2019); 'New Models for Science Diplomacy Transcending Boundaries: The InterAcademy Partnership Food and Nutrition Security and Agriculture Project', *Science & Diplomacy* (June 2019); 'Transforming food systems to deliver healthy, sustainable diets—the view from the world's science academies', *The Lancet Planetary Health* (Feb 2019).

Meetings and Member Academies

EASAC's member academies are committed to hosting many of the organisation's important regular events. EASAC's Council meetings in 2019 were hosted by the Council of Finnish Academies in Helsinki, Finland, in June, and by the Croatian Academy of Sciences in Zagreb, Croatia, in November. The meeting in Helsinki was preceded by a half-day 'Nordic-Baltic-Meeting' of representatives of the Estonian, Danish, Finnish, Latvian, Lithuanian, Norwegian and Swedish academies. It was also complemented by a public discussion event Helsinki city centre, with presentations and discussions of the key messages from EASAC on forest bioenergy and on climate change and health.

The Energy Steering Panel was hosted by the Swiss Academies of Arts and Sciences in March and held a second meeting in October in Brussels, Belgium. The Environment Steering Panel were hosted by the Slovenian Academy of Sciences and Arts in April and by the Slovak Academy of Sciences in October. The Biosciences Steering Panel held its meeting in October, in Brussels, Belgium. Each of the two meetings of the active working groups 'Packaging Plastics in the Circular Economy' and 'Regenerative Medicine' were held in Brussels, Belgium. The two working group meetings of 'Changes in Ocean Circulation' were held in Bergen, Norway. The Swiss Academies of Arts and Sciences supported the annual Strategy Meeting of the EASAC Bureau. By hosting such meetings, EASAC member academies are providing much appreciated in-kind support to the activities of EASAC and IAP.

World Science Forum

Together with IAP, EASAC is one of the partner organisations supporting the Hungarian Academy of Sciences and UNESCO in organising the bi-annual World Science Forum (WSF). In November 2019, EASAC contributed five thematic sessions to the WSF, on topics related to food and nutrition security and agriculture, climate change and health, the decarbonisation of transport, and regenerative medicine. ■

Inter-American Network of Academies of Science (IANAS)

IANAS is a network of 21 academies of science and three scientific organisations. Its mission is to strengthen science communities in the Americas through capacity building and to provide an independent source of science policy advice to governments and the public on key challenges for the future of the region.

The IANAS Water Programme meeting in California, USA.

General Assembly

The general assembly of IANAS, held on 26-27 May 2019, was generously hosted by the Colombian Academy of Exact, Physical and Natural Sciences in Bogotá, Colombia. It was attended by representatives from 22 academies of the Americas who also participated, with both national and international speakers, in the celebrations of the 83rd anniversary of one of Colombia's largest financial conglomerates, the *Grupo Bolivar*, on 28 May.

During the general assembly, Jeremy McNeil (Royal Society of Canada) was re-elected as co-chair for a second term and Helena Nader (Brazilian Academy of Sciences) was elected to replace the outgoing Juan Asenjo (Chilean Academy of Sciences). The following academies were elected to the new Executive Committee: *Academia Nacional de Ciencias Exactas, Físicas y Naturales* (Buenos Aires), *Academia de Ciencias Médicas, Físicas y Naturales de Guatemala*, Mexican Academy of Sciences, *Academia Nacional de Ciencias de Peru*, the Caribbean Academy of Sciences and the US National Academy of Sciences.

The *Academia Nacional de Ciencias de Argentina* (Cordoba) generously agreed to host the IANAS Secretariat, taking over from the Mexican Academy of Sciences. The new Executive Director of IANAS is Beatriz Capputo.

The collected assembly acknowledged the excellent contributions of Juan Asenjo during his two mandates as co-chair of IANAS, and of Adriana De la Cruz during her time as executive director of IANAS at the Mexican academy.

Water Programme

The IANAS Water Programme held its annual meeting on 10-11 December 2019 at the Beckman Center in Irvine, California, USA. This was attended by 11 focal points, with five more participating remotely during a summary session at the end of the meeting. The meeting focused on the development and preparation of a strategic plan to guide the water programme through an era with less support anticipated from previous sources. One important outcome of the meeting was to identify future locations of annual meetings and efforts for involving the various country academies more fully in the activities of the IANAS Water Programme.

More concretely, the Water Programme finalised and arranged for the publication of several documents in 2019, including 'Water Quality in the Americas: Risks and Opportunities' published in both Spanish and English. Copies were sent to all 21 country focal points and received wide distribution thanks to a series of special events organised by the academies to launch the book on 22 March, World Water Day.

Women for Science Programme

The Women for Science (WfS) Programme held a successful meeting on 13-14 August 2019, hosted in Bogotá, Colombia, by the Colombian academy. To be more effective with available funds, a plan was developed to encourage each academy to undertake more local activities designed to increase female membership and promote the awareness of the importance of women in science. This has resulted in several academies establishing special commissions to promote the participation of women in science and to organise scientific meetings and networks of women scientists and speakers. The members of the WfS Programme also contributed an important chapter on 'Gender, Women and the Quality of Water' to the 'Water Quality in the Americas: Risks and Opportunities' publication mentioned above.

The WfS group also updated the IANAS membership census. Results of a questionnaire sent to all academies show a moderate improvement in numbers of women being elected and holding executive positions – but there is still a long way to go before the goal of gender parity is reached.

The biographies of women scientists are still being collected from academies that did not participate in the earlier IANAS biography project (2013) and several academies are committed to producing videos of women scientists and students in various stages of their programmes. Furthermore, there was a decision to change the scope of a project initially looking at 'Women Scientists as Entrepreneurs' to 'Women Scientists as Leaders' in order to include a wide variety of fields, such as journalism, politics and sports. Each country will prepare a text on a woman scientific leader who has developed a successful career outside academia, with the goal of producing a publication for general distribution. The group also decided to continue presenting the Anneke Levelt Sengers Prize every two years, with the next call to be launched in 2020. ■

Network of African Science Academies (NASAC)

The Network of African Science Academies (NASAC) was established in 2001 in Nairobi, Kenya, and is the affiliate network for IAP in Africa. NASAC is a consortium of 28 merit-based science academies in Africa that 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 supports the creation of new academies in countries in Africa where none exist.

In 2019, NASAC activities were both intense and informative. Its internal processes were also streamlined and existing partnerships strengthened.

Integrated Research

The 'Leading Integrated Research for Agenda 2030 in Africa' (LIRA2030 Africa) initiative, implemented in partnership between NASAC and the International Science Council (ISC) with support from the Swedish International Development Cooperation Agency (Sida), awards grants to early career African researchers undertaking trans-disciplinary research. The project is currently supporting 28 grantees.

On 25-28 March 2019, the Scientific Advisory Committee (SAC) meeting and the LIRA2030 Annual Research Forum were held at the *Université Cheikh Anta Diop* in Dakar, Senegal. Additionally, an intensive training workshop on trans-disciplinary research was held on 18-19 November in Accra, Ghana, together with a project coaching workshop on 20-22 November. NASAC also organised site-visits to four supported projects and confirmed that they were making sustained headway in persuading African cities to deal with urban challenges through the science-community-policy nexus. The projects visited are undertaking research on: 'Standardising City-level Data-gathering towards Achieving Sustainable Development Goal 11 in Africa' (SCiLeD) (Lagos, Nigeria); 'Integration of Housing and Health Policies for Inclusive, Sustainable African Cities' (Cape Town, South Africa); 'Transforming Cities in a Changing Climate' (Cape Town, South Africa); and 'Co-creating an Urban Framework for Localised Norms on Sustainable Energy' (Kampala, Uganda).

Engaging Academies on SDG and AU Processes

NASAC participated in a workshop on Sustainable Development Goal 6 (SDG#6, water and sanitation) that was hosted by the Academy of Science of South Africa (ASSAf) on 23-24 July 2019 in Pretoria, South Africa. During the workshop, NASAC learned first-hand from the process of deliberations with policymakers on how to engage and enhance the value of science academies in the delivery of the United Nations SDG Agenda 2030 in Africa and the African Union (AU) Agenda 2063. At the event, NASAC also presented its policymakers' booklet on the 'Grand Challenge of Water Security in Africa' and moderated discussions on how to engage with policymakers on the continent, focusing on how the booklet maps onto the SDG#6 targets and indicators. The IAP report 'Harnessing Science, Engineering and Medicine to Address Africa's Challenges: The Role of African National Academies' was also launched at this event (see page 17).

Students at the Third Belt and Road Teenager Maker Camp and Teacher Workshop in Nanning, China.

Prior to the meeting, on 22 July, the NASAC Board met with the African Scientific Research and Innovation Council (ASRIC), to discuss, among other issues, the relationship between the two bodies. NASAC and ASRIC will aim to find ways to collaborate, synchronise and synthesise their actions in order to create lasting impact, and develop solutions that support policymaking. Being a research council for Africa, ASRIC will support scientists and research groups through scholarly publishing, provision of internships, and issuance of grants, prizes and awards.

Climate Change and Health

NASAC participated in the kick-off meeting of the IAP project on 'Climate Change and Health' held in Halle, Germany, on 3-5 November 2019. NASAC used this opportunity to build on its previous work on two policymakers' booklets that addressed 'Changing Disease Patterns in Africa' and 'Climate Change Adaptation and Resilience in Africa'. The Africa report on 'Climate Change and Health' will focus on the severe impacts of climate change on the African continent, given that a large proportion of agricultural production is rain-fed. Through this report, due to be published in 2021, NASAC hopes to promote better livelihood options for all, and to improve coordination between different sectors. The report will highlight several case studies from which lessons learned can be drawn and success stories shared. Additionally, and in pursuit of knowledge co-creation, young scientists and relevant stakeholders from both public and private sectors will be included. The publication will complement existing initiatives, provide advice rather than prescribing recommendations, and refer to the economic cost of different policy alternatives, including inaction.

Academy Development Initiative

Globally, there are currently only 13 academies of science in the 47 Least Developed Countries (LDCs). To address this issue, NASAC is partnering with the UN Technology Bank for LDCs to undertake sub-regional consultations on the need to support existing academies and establish new ones in African LDCs. This initiative facilitated four consultation fora held in Uganda (2-3 September), Guinea (9-10 September), Madagascar (18-19 September), and Mauritania (25-26 September). The programme intends to strengthen the existing academies of science and support the creation academies in LDCs where they currently do not exist. The eventual success of such academies will be determined by their ability to devise policies, form partnerships and encourage interactions at all levels of science, technology and innovation (STI) in their nations and regions. This programme builds on work already done by IAP under the 'Improving Scientific Input to Global Policy-making' project and complements the competitive capacity building grants provided by NASAC supported by funding from IAP. In this regard, a grant to the Ugandan National Academy of Sciences supported the undertaking of a consensus study and publication of a policy brief on urbanisation in Africa, while a grant to the Botswana Academy of Sciences enabled the purchase of IT equipment and office furniture, as well as to develop its forthcoming website.

Science Education

The Third Belt and Road Teenager Maker Camp and Teacher Workshop was held in Nanning, China, on 24-30 September 2019. Participation was drawn from students, science teachers, and officers of science and education administrations, totaling nearly 300 people from 35 countries and international organisations from Asia, Europe, Africa, the Americas and Oceania. The theme was 'Openness for Fusion and Innovation for Development'. Through NASAC's involvement, the Nanning event had representation from Kenya (2 teachers, 5 students), Tunisia (2

Group photo at AMASA-15.

teachers, 5 students), Uganda (2 teachers, 5 students) and Zimbabwe (1 student and 1 teacher). During the event, many students were awarded medals in various categories. NASAC hopes eventually to be able to host a similar initiative to promote science education in Africa (see also page 24).

Annual Meeting of African Science Academies

The Fifteenth Annual Meeting of African Science Academies (AMASA-15) was hosted by the Ghana Academy of Arts and Sciences (GAAS) in Accra, Ghana, on 13-16 November 2019. The theme of the meeting was 'Science, Technology and Innovation for Food Security and Poverty Alleviation in Africa: The role of academies'. More than 100 participants from 22 countries attended the event, representing governments, academies, universities and research institutions. Besides the scientific sessions, there were also interactive collaborative-learning sessions, which provided an opportunity for the academies to learn from each other. The topics covered were 'Science Diplomacy', 'Bringing Science to the Public', 'Science Agenda for Agriculture' and 'Harnessing SEM to address Africa's Challenges'.

AMASA-15 was officially opened by H. E. Nana Addo Dankwa Akufo Addo, President of the Republic of Ghana, and the Honorable Minister for Environment, Science, Technology and Innovation, Kwabena Frimpong-Boateng. In his opening remarks, President Akufo Addo emphasized the key role the African academies have in moving their countries onto the path of sustained progress and prosperity, stating that all the aspects of our lives are now ruled by science, technology and innovation.

General Assembly

The NASAC General Assembly (GA) meeting was held on 15 November in Accra, Ghana, hosted by the Ghana Academy of Arts and Sciences. In attendance were representatives from 19 out of NASAC's 27 member academies. Activity reports, audits, finances and the budget for 2020 were presented and subsequently approved by the GA. Members also endorsed the membership applications from the Burundi Academy of Sciences and Technology (BAST) and the Tunisia Academy of Sciences, Arts and Letters. These new NASAC members are now being encouraged to apply for full IAP membership. The meeting also elected a new Board of NASAC with Mahouton Norbert Hounkonnou (Benin) as the new president. ■

Nana Addo Dankwa Akufo-Addo, President of Ghana, at AMASA-15.

Appendices

Members of the InterAcademy Partnership

1. Afghanistan Academy of Sciences
2. Albanian Academy of Sciences
3. *Academia Nacional de Ciencias Exactas, Fiscas y Naturales de la Republica Argentina*
4. *Academia National de Ciencas*, Cordoba, Argentina
5. *Academia Nacional de Medicina de Buenos Aires*, Argentina
6. National Academy of Sciences of Armenia
7. Academy of Medical Sciences of Armenia
8. Australian Academy of Science
9. Austrian Academy of Sciences
10. Bangladesh Academy of Sciences
11. National Academy of Sciences of Belarus
12. Royal Academies for Science and the Arts of Belgium
13. Belgian Royal Academy of Medicine
14. Benin National Academy of Sciences and Arts
15. *Academia Nacional de Ciencias de Bolivia*
16. *Academia Boliviana de Medicina*
17. Academy of Sciences and Arts of Bosnia and Herzegovina
18. Brazilian Academy of Sciences
19. *Academia Nacional de Medicina*, Brazil
20. Bulgarian Academy of Sciences
21. National Academy of Sciences of Burkina Faso
22. Cameroon Academy of Sciences
23. Royal Society of Canada
24. Canadian Academy of Health Sciences
25. *Academia Chilena de Ciencias*
26. *Academia Chilena de Medicina*
27. Chinese Academy of Sciences
28. Chinese Academy of Engineering
29. *Academia Sinica*, Taiwan, China
30. Colombian Academy of Exact, Physical & Natural Sciences
31. *Academia Nacional de Medicina de Colombia*
32. Croatian Academy of Arts and Sciences
33. Croatian Academy of Medical Sciences
34. Cuban Academy of Sciences
35. Czech Academy of Sciences
36. Royal Danish Academy of Sciences and Letters
37. *Academia de Ciencias de la Republica Dominicana*
38. Academy of Sciences of Ecuador
39. Academy of Scientific Research and Technology, Egypt
40. Estonian Academy of Sciences
41. Ethiopian Academy of Sciences
42. Council of Finnish Academies
43. *Académie des Sciences, Institut de France*
44. *Académie Nationale de Médecine*, France
45. *Académie des Technologies*, France
46. Georgian National Academy of Sciences
47. Georgian Academy of Medical Sciences
48. Union of German Academies of Sciences and Humanities
49. German National Academy of Sciences, *Leopoldina*
50. Ghana Academy of Arts and Sciences
51. Academy of Athens, Greece
52. *Academia de Ciencias Medicas, Fisicas y Naturales de Guatemala*
53. National Academy of Sciences of Honduras
54. Hungarian Academy of Sciences
55. Indian National Science Academy
56. National Academy of Medical Sciences, India
57. Indonesian Academy of Sciences
58. Academy of Sciences of the Islamic Republic of Iran
59. Iranian Academy of Medical Sciences
60. Royal Irish Academy
61. Israel Academy of Sciences and Humanities
62. *Accademia Nazionale dei Lincei*, Italy
63. *Accademia Nazionale di Medicina*, Italy
64. Science Council of Japan
65. Royal Scientific Society, Jordan
66. National Academy of Sciences of the Republic of Kazakhstan
67. Kenya National Academy of Sciences
68. Korean Academy of Science and Technology
69. National Academy of Medicine of Korea
70. National Academy of Sciences, Republic of Korea
71. Kosova Academy of Sciences and Arts
72. National Academy of Sciences of the Kyrgyz Republic
73. Latvian Academy of Sciences
74. Lebanese Academy of Sciences
75. Lithuanian Academy of Sciences
76. Macedonian Academy of Sciences and Arts
77. Madagascar's National Academy of Arts, Letters and Sciences
78. Academy of Sciences Malaysia
79. Mauritius Academy of Science and Technology
80. Mexican Academy of Sciences
81. National Academy of Medicine of Mexico
82. Academy of Sciences of Moldova
83. Mongolian Academy of Sciences
84. Montenegrin Academy of Sciences and Arts
85. Hassan II Academy of Science and Technology, Morocco
86. Academy of Science of Mozambique
87. Nepal Academy of Science and Technology
88. Royal Netherlands Academy of Arts and Sciences
89. Royal Society of New Zealand - *Te Apārangi*
90. Nicaraguan Academy of Sciences
91. Nigerian Academy of Science
92. Norwegian Academy of Sciences and Letters
93. Pakistan Academy of Sciences
94. Palestine Academy for Science and Technology
95. *Academia Nacional de Ciencias del Perú*
96. *Academia Nacional de Medicina del Perú*
97. National Academy of Science and Technology, Philippines
98. Polish Academy of Sciences
99. *Academia das Ciencias de Lisboa*, Portugal
100. Romanian Academy
101. Academy of Medical Sciences of Romania
102. Russian Academy of Medical Sciences
103. Russian Academy of Sciences
104. *Académie des Sciences et Techniques du Sénégal*
105. Serbian Academy of Sciences and Arts
106. Singapore National Academy of Sciences
107. Slovak Academy of Sciences
108. Slovenian Academy of Sciences and Arts
109. Academy of Science of South Africa
110. *Real Academia de Ciencias Exactas, Fisicas y Naturales*, Spain
111. National Academy of Sciences, Sri Lanka
112. Sudanese National Academy of Sciences
113. Royal Swedish Academy of Sciences
114. Swiss Academies of Arts and Sciences
115. Academy of Sciences of the Republic of Tajikistan
116. Tanzania Academy of Sciences
117. Thai Academy of Science and Technology
118. Turkish Academy of Sciences
119. Uganda National Academy of Sciences
120. National Academy of Sciences of Ukraine
121. Academy of Medical Sciences, UK
122. Royal Society, UK
123. US National Academy of Sciences
124. US National Academy of Medicine
125. National Academy of Sciences of Uruguay
126. Uzbekistan Academy of Sciences
127. *Pontificia Academia Scientiarvm*, Vatican
128. *Academia de Ciencias Fisicas, Matematicas y Naturales de Venezuela*
129. *Academia Nacional de Medicina de Venezuela*
130. Zambia Academy of Sciences
131. Zimbabwe Academy of Sciences
132. African Academy of Sciences
133. Caribbean Academy of Sciences
134. European Academy of Sciences and Arts
135. Federation of European Academies of Medicine (FEAM)
136. Global Young Academy
137. Islamic World Academy of Sciences
138. Latin American Academy of Sciences
139. TWAS, The World Academy of Sciences
140. World Academy of Art and Science

IAP Financial Summary, 2019

The total amount of funds received by IAP Science and IAP Health (via the Trieste secretariat) for activities in 2019 was USD 812,972. With USD 800,826 brought forward from the previous year, this meant an operating budget of USD 1,613,798.

The main contribution was from the Italian Ministry of Foreign Affairs (USD 747,725). Additional contributions were received from the US National Academy of Sciences, the World Health Summit Foundation, and the Swiss Academy of Arts and Sciences.

The total amount of funds received by IAP Policy (via the Washington DC secretariat) in 2019 was USD 414,824. Income primarily came from the US National Academies of Sciences, Engineering and Medicine (NASEM) as host of the IAP Policy secretariat, and grants for two studies from the Carnegie Corporation of New York through the Institute for Advanced Study.

In addition, it is estimated that member academies and regional affiliated networks contributed more than USD 1,000,000 by leveraging funds for activities from other donors, and through in in-kind support for the organisation and hosting of conferences and workshops, travel support for their representatives to IAP and other events, the publication of reports, as well as the provision of staff time.

In 2019, special mention should be made of the Korean Academy of Science and Technology (KAST) for hosting the IAP conference and General Assembly in Songdo, Korea. In addition, the Science Education Programme's Global Council and policy forum were hosted by Thailand's National Science Museum in Bangkok; the Hungarian Academy of Sciences kindly hosted IAP representatives and a group of some 40 young scientists at the World Science Forum in Budapest; the Vietnam Young Academy, which was the official host academy of the World Wide Meeting of Young Academies (WWMYA); and the Academy of Science of South Africa, which hosted an event at which an IAP on the Sustainable Development Goals (SDGs) was launched.

IAP Health activities leveraged additional funding from the UK Academy of Medical Sciences and the Bayer Science and Education Foundation.

Special thanks are also due to the various academies that hosted events of IAP's regional networks, the Indian National Science Academy, KAST, the Pakistan Academy of Sciences, and the National Academy of Science of Sri Lanka for AASSA; the Croatian Academy of Sciences, the Council of Finnish Academies, the Slovenian Academy of Sciences and Arts, the Slovak Academy of Sciences, and the Swiss Academies of Arts and Sciences for EASAC; for IANAS, the Colombian Academy of Exact, Physical and Natural Sciences, which hosted the IANAS general assembly, and the *Academia Nacional de Ciencias de Argentina* (Cordoba), which has generously agreed to take over the hosting of the IANAS secretariat; and for NASAC, the Academy of Science of South Africa, and the Ghana Academy of Arts and Sciences (GAAS), which hosted the Fifteenth Annual Meeting of African Science Academies (AMASA 15) and the NASAC general assembly.

IAP Science and IAP Health Financial Summary, 2019

INCOME[1] 2019 (in USD)	
Balance brought forward 01.01.2019	**800,825.90**
1) Ministry of Foreign Affairs, Italy	747,724.88
2) National Academy of Sciences, USA	25,000.00
3) World Health Summit Foundation, Germany	6,600.66
4) Swiss Academy of Medical Sciences	4,996.90
5) Interest	28,650.00
TOTAL INCOME	**1,613,798.34**

EXPENDITURE 2019 (in USD)	Approved Budget	Spent
1) Scientific Projects		
1.1) New Projects	85,000	75,033.68
1.2) Regional Network Programmes	260,000	225,261.82
1.3) Policy collaboration with IAC	46,000	51,000.00
1.4) Fundraising for new activities	130,260	65,261.93
Sub-Total for (1)	**521,260**	**416,557.43**
2) Meetings and Conferences		
2.1) Executive Committee Meetings/GA Conference/Travels	80,000	61,274.53
2.2) Conference for Young Scientists	10,000	14,300.00
2.3) Young Physician Leaders	208,889	53,835.83
2.3.1) World Health Summit Workshop	46,900	22,517.74
2.3.2) World Health Assembly alumni Mtg	40,000	
2.3.3) Web networking	15,000	
2.3.4) Communication Costs	90,000	22,156.03
2.3.5) Staff cost	16,989	9,162.06
Sub-Total for (2)	**298,889**	**129,410.36**
3) Publications		
3.1) Website	4,000	
3.2) Other publications	15,000	6,653.42
Sub-Total for (3)	**19,000**	**6,653.42**
4) Operational Expenses		
4.1) Staff and Consultant Costs	638,400	346,438.16
4.1.1) General Staff Costs	343,000	286,352.85
4.1.2) Strengthening Staff Cost	295,400	60,085.31
4.2) Staff travels	10,000	5,285.13
4.3) Communications	5,000	980.16
4.4) Office and Other Supplies	5,000	5,340.23
4.5) ICTP services	15,000	15,000.00
Sub-Total for (4)	**673,400**	**373,043.68**
Management Costs	**105,878**	**64,796.60**
TOTAL EXPENDITURE	**1,618,427**	**990,461.49**
Savings on prior years' obligations		**103,044.55**
Excess (Shortfall) of income over expenditure		**726,381.40**

Reserve Fund[2]	
Amount available at the beginning of period	177,301.51
Transfer from IAP account	0.00
End of service entitlements	0.00
Reserve Fund balance end of period	**177,301.51**

[1] All contributions are expressed in US dollars and have been converted using the UN official rate of exchange in effect at the time the contributions were received.

[2] The purpose of the Reserve Fund is to cover the end of service entitlements of IAP staff.

IAP Policy Financial Summary, 2019[1]

The total amount of funds received by IAP Policy in 2019 was USD $414,824. Income came from the US National Academies of Sciences, Engineering and Medicine (NASEM) as host of the IAP Policy secretariat, the Carnegie Corporation of New York through the Institute for Advanced Study to support the projects 'Improving Scientific Input to Global Policymaking: Strategies for Attaining the Sustainable Development Goals', and 'Harnessing Science, Engineering, and Medicine to Address Africa's Challenges', IAP for Science's contribution for the costs of the InterAcademy Partnership website, and IAP Policy indirect charges. A small amount came from royalties earned on the book, 'Doing Global Science: A guide to responsible conduct in the global research enterprise'.

INCOME (in USD)	
Beginning Balance	496,450
US NASEM contribution	292,763
Projects and administration	121,000
Book royalties	195
Other Income	866
TOTAL INCOME	**414,824**

EXPENDITURES (in USD)	
Project expenses	432,750
Operational expenses	
1) Staff salaries	119,567
2) Website and public information	50,300
3) Non-project travel	494
4) Professional fees	53,122
5) Miscellaneous	643
6) Administration	150,457
TOTAL EXPENDITURE	**807,333**
Excess (shortfall) of income over expenditure	**103,941**

[1] Sources for report include: Marcum LLP and NASEM finance staff.

Member Contributions

Member Contributions to IAP's Fundraising Campaign and Voluntary Membership Dues (2013-present)

- Australian Academy of Science
- Bangladesh Academy of Sciences
- Council of Finnish Academies
- Georgian National Academy of Sciences (GAS)
- Union of German Academies of Sciences and Humanities
- *Deutsche Akademie der Naturforscher Leopoldina*
- Academy of Athens, Greece
- Israel Academy of Sciences and Humanities
- Korean Academy of Science and Technology (KAST)
- National Academy of Science and Technology, Korea (NAST)
- Hassan II Academy of Science and Technology, Morocco
- Academy of Medical Sciences of Romania
- *Académie National des Sciences et Techniques du Senegal*
- Turkish Academy of Sciences (TÜBA)
- Uganda National Academy of Sciences (UNAS)
- Royal Society, UK
- US National Academy of Sciences (NAS)
- *Academia Nacional de Ciencias del Uruguay*

Project Support

IAP projects are also being implemented by various partners.

The German National Science Academy, Leopoldina, for example, manages funds from the German Federal Ministry of Education and Research for the IAP 'Climate Change and Health' project (see pages 20-21), as well as leading the project on 'Arctic Warming and Microbial Threats' (see page 30).

In-kind Support

IAP would like to thank its many member academies that have contributed to its fundraising campaign, have provided voluntary membership contributions, or that have provided in-kind support. Without this buy-in from the members, IAP activities would have much less visibility and impact around the globe.

Standing Committees

InterAcademy Partnership Steering Committee

- Volker ter Meulen, Germany (IAP President)
- Depei Liu, China (IAP President and co-chair IAP Health)
- Margaret (Peggy) A. Hamburg, USA (co-chair IAP Health)
- Krishan Lal, India (co-chair IAP Science)
- Cherry Murray, USA (co-chair IAP Science)
- Richard Catlow, UK (co-chair IAP Policy)
- Masresha Fetene, Ethiopia (co-chair IAP Policy)
- Michael T. Clegg, USA (IAP Treasurer)

In addition to the Steering Committee members, the following individuals, representing the IAP regional networks, make up the InterAcademy Partnership Board

- Yoo Hang Kim, South Korea (Association of Academies and Societies of Sciences in Asia, AASSA)
- Christina Moberg, Sweden (European Academies' Science Advisory Council, EASAC)
- Helena Bonciani Nader, Brazil (Inter-American Network of Academies of Science, IANAS)
- Mahouton Hounkonnou, Benin (Network of African Science Academies, NASAC)

IAP Science Executive Committee

- Krishan Lal, India (co-chair)
- Cherry Murray, USA (co-chair)
- *Academia Chilena de Ciencias*, Juan A. Asenjo
- *Académie des Sciences*, France, Olivier Pironneau
- Academy of the Islamic Republic of Iran, Jafar Towfighi Darian
- *Accademia Nazionale dei Lincei*, Italy, Gianfranco Pacchioni
- African Academy of Sciences, Felix Dapare Dakora
- Australian Academy of Science, Elaine Sadler
- Ethiopian Academy of Science, Tsige Gebre-Mariam
- German National Academy of Sciences, *Leopoldina*, Bärbel Friedrich
- Korean Academy of Science and Technology, Min-Koo Han
- Nigerian Academy of Science, Mosto Onuoha
- Royal Scientific Society of Jordan, Ruba Al Zubi

Ex-officio member:

- The World Academy of Sciences (TWAS), Mohamed H. A. Hassan

IAP Health Executive Committee

- Margaret (Peggy) A. Hamburg, USA (co-chair)
- Depei Liu, China (co-chair)
- *Academia Nacional de Medicina*, Argentina, Jorge Alberto Neira
- *Accademia Nazionale dei Lincei*, Italy, Guido Forni
- Academy of Sciences Malaysia, Lai-Meng Looi
- Brazilian Academy of Sciences, Helena Bonciani Nader
- Council of Finnish Academies, Jukka H. Meurman
- German National Academy of Sciences, *Leopoldina*, Wolfgang Holzgreve
- *Académie Nationale de Médecine*, France, Patrice Debré
- Hassan II Academy of Science & Technology, Morocco, Rajae El Aouad
- Nigerian Academy of Science, Sonny Folorunso Kuku

Ex-officio member:

- The World Academy of Sciences (TWAS), Mohamed H. A. Hassan

IAP Policy Board

- Richard Catlow, UK (co-chair)
- Masresha Fetene, Ethiopia (co-chair)
- African Academy of Sciences, Felix Dapare Dakora
- Australian Academy of Science, John Shine
- Brazilian Academy of Sciences, Luiz Davidovich
- Chinese Academy of Sciences, Tao Zhang
- *Académie des Sciences*, France, Pierre Corvol
- German National Academy of Sciences, *Leopoldina*, Gerald Haug
- Indian National Science Academy, Ajay K. Sood
- *Accademia Nazionale dei Lincei*, Italy, Giorgio Parisi
- Science Council of Japan, Juichi Yamagiwa
- Royal Scientific Society of Jordan, HRH Princess Sumaya bint El Hassan
- Mexican Academy of Sciences, José Luis Morán López
- Royal Netherlands Academy of Arts and Sciences, Wim Van Saarloos
- Nigerian Academy of Science, Mosto Onuoha
- National Academy of Sciences, Sri Lanka, Ranjith Mahindapala
- The World Academy of Sciences (TWAS), Mohamed H. A. Hassan

Ex-Officio Member:

- International Council of Academies of Engineering and Technological Sciences (CAETS), Ruth David

Observers:

- U.S. National Academy of Sciences, Marcia McNutt
- International Science Council (ISC), Heide Hackmann

Science for Poverty Eradication Committee

- Luiz Davidovich, Brazilian Academy of Sciences (chair)
- Lai Meng Looi, IAP Health
- Aya Abe, AASSA
- Aishah Bidin, AASSA
- Richard Catlow, EASAC
- Peter Fritz, EASAC
- Ricardo Paes de Barros, IANAS
- Judith Teichman, IANAS
- Yousuf Maudarbocus, NASAC
- Ratemo Michieka, NASAC
- Robert Lepenies, GYA

Science Education Programme (SEP) Global Council

- Wafa Skalli, Morocco (chair)
- Mustafa El Tayeb, Sudanese National Academy of Science (immediate past chair)
- Carlos Bosch, Mexican Academy of Sciences
- Edgar González, Nanoscale Science and Technology Centre, Colombia
- Aphiya Hathayatham, National Science Museum, Thailand
- Norbert Hounkonnou, Benin National Academy of Sciences
- R. Indarjani, Southeast Asian Ministers of Education Organization (SEAMEO), Indonesia
- Lena Kjellén, Uppsala University, Sweden
- Lazzat Kussainova, International Centre for Scientific Collaborations, Kazakhstan
- Carol O'Donnell, Smithsonian Science Education Center (SSEC), USA
- Daniel Rouan, *Fondation La main à la pâte*, France
- Manzoor H. Soomro, ECO Science Foundation (ECOSF), Pakistan

Improving Scientific Input to Global Policymaking: Strategies for Attaining the Sustainable Development Goals Working Group Members

- Eva Alisic, Australia (co-chair)
- Jinghai Li, China (co-chair)
- Michael Barber, Australia
- Peter Fritz, Germany
- Norichika Kanie, Japan
- Muhammad Saidam, Jordan
- Francisco José Sánchez-Sesma, Mexico
- Rajae El Aouad, Morocco
- Robert Scholes, South Africa
- Keto E. Mshigeni, Tanzania
- Sandy Harrison, United Kingdom

Harnessing Science, Engineering and Medicine to Address Africa's Challenges Working Group Members

- Robin Crewe, South Africa (co-chair)
- Oyewale Tomori, Nigeria (co-chair)
- T.J. Higgins, Australia
- Norbert Hounkonnou, Benin
- Sameh Soror, Egypt
- Odile Macchi, France
- Peter Fritz, Germany
- Eric Odada, Kenya
- Rajaâ Cherkaoui El Moursli, Morocco
- Himla Soodyall, South Africa
- Guéladio Cissé, Switzerland
- Keto E. Mshigeni, Tanzania
- Richard Catlow, UK
- Cato Laurencin, USA

Meetings Supported in 2019

January
- Washington DC, USA, IANAS Executive Committee Meeting, 14-15 January 2019
- Tunis, Tunisia, CESAME workshop, 21-25 January 2019
- Trieste, Italy, IAP Secretariat Meeting, 28-29 January 2019

February
- Washington DC, USA, 'Transforming Food Systems to Deliver Healthy, Sustainable Diets: The view from the world's science academies', 14 February 2019
- Washington DC, USA, AAAS conference session on 'Food and Nutrition Security: Scientific partnerships and opportunities', 15 February 2019
- New Delhi, India, AASSA-INSA-NISCAIR Regional Workshop 'Science Breakthrough: Paid News, Fake News & Ethics', 20-22 February 2019

March
- Brussels, Belgium, launch of the EASAC report on 'Decarbonisation of Transport', 20 March 2019
- Dakar, Senegal, NASAC-ISC 'Leading Integrated Research for Agenda 2030 in Africa (LIRA2030 Africa)' Scientific Advisory Committee Meeting, 25-28 March 2019
- Kish Island, Iran, launch of IAP Statement on 'Trauma' at World Health Summit Regional Meeting, 29-30 March 2019

April
- Berne, Switzerland, EASAC Energy Steering Panel meeting, 4 April 2019
- Berne, Switzerland, launch of the EASAC report on 'Decarbonisation of Transport', 5 April 2019
- Songdo, Korea, IAP Conference and General Assembly, 9-11 April 2019
- Brussels, Belgium, EASAC Working Group meeting 'Plastics in the Circular Economy', 12 April 2019
- Ljubljana, Slovenia, EASAC Environment Steering Panel meeting, 17 April 2019
- Brussels, Belgium, EASAC Working Group meeting 'Regenerative Medicine', 26 April 2019

May
- Halle, Germany, International Conference and Anniversary Annual General Meeting of the Global Young Academy, 29 April - 3 May 2019
- Brussels, Belgium, EASAC Bureau meeting, 7-8 March 2019
- Pretoria, South Africa, GYA Science Advice for Policy Workshop, 25-27 March 2019
- Santiago, Chile, Education on Climate Change, 6-10 May 2019
- Nairobi, Kenya, second workshop for the project 'Neonicotinoids and their impact on ecosystem services for agriculture and biodiversity in Africa' at ICIPE, 13-15 May 2019
- Bogotá, Colombia, IANAS General Assembly, 26-27 May 2019
- Bergen, Norway, EASAC Working Group meeting 'Changes in Ocean Circulation', 27 May 2019
- London, UK, UK AMS-IAP workshop on 'Achieving Universal Health Coverage in LMICs: The role of quality of care research', 29-30 May 2019

June
- Cape Town, South Africa, CESAME teacher-training workshop and AEMASE Steering Committee, 10-14 June 2019
- Helsinki, Finland, EASAC Council and Bureau meetings, 13-14 June 2019
- Helsinki, Finland, EASAC Nordic-Baltic meeting, 13 June 2019
- Colombo, Sri Lanka, AASSA-NASSL Regional Workshop 'Managing Urbanization in Asia', 25-26 June 2019

July
- Geneva, Switzerland, side event, Meeting of Experts of the Biological and Toxin Weapons Convention (BWC), 31 July - 2 August 2019

August
- Geneva, Switzerland, IAP-NASEM workshop 'Frameworks for Assessing the Risks and Benefits of Advances in Science and Technology: An experts meeting to inform the States Parties of the Biological and Toxin Weapons Convention', 1 August 2019
- Paris, France, IAP-ISC leadership meeting, 8 August 2019
- Bangkok, Thailand, 'Innovative Forum for ASEAN Museums towards Achieving Science and SDG Awareness in the Community', 8-19 August 2019
- Bogotá, Colombia, IANAS Women for Science Annual Meeting, 13-14 August 2019
- Islamabad, Pakistan, AASSA-PAS Workshop 'Complementary Medicine as an Answer to Challenges Faced in Achieving Sustainable Goals in Health', 19-21 August 2019
- Bangkok, Thailand, 'Policy Forum on Science Literacy: Roles of science museums and science centres', 20-21 August 2019
- Bangkok, Thailand, meeting of the IAP Science Education Programme's Global Council, 21 August 2019

September
- Paris, France, session contribution to 'Return Home to UNESCO', 3-5 September 2019
- Brussels, Belgium, EASAC Working Group meeting 'Plastics in the Circular Economy', 5 September 2019
- Trieste, Italy, OPCW-TWAS-IAP workshop on 'Policy and Diplomacy for Scientists: Introduction to responsible research practices in chemical and biochemical sciences', 9-13 September 2019
- Geneva, Switzerland, EASAC Strategy and Team Meeting (Bureau), 12-13 September 2019
- Seoul, Korea, AASSA Executive Board meeting, 23-24 September 2019
- Seoul, Korea, AASSA-KAST Regional Workshop 'Crop Biotechnology for Sustainable Agriculture', 23-24 September 2019
- Nanning, China, IAP SEP contributions to 'Third Belt and Road Teenager Maker Camp and Teacher Workshop', 24-30 September 2019

October
- Brussels, Belgium, launch of the EASAC report on 'Climate Change and Health in Europe', 1 October 2019
- London, UK, UK AMS-IAP-MRC workshop 'Multidisciplinary Research in Epidemic Preparedness and Response', 2-3 October 2019
- Brussels, Belgium, EASAC Biosciences Steering Panel meeting, 3 October 2019
- Bratislava, Slovakia, EASAC Environment Steering Panel meeting, 3 October 2019
- Brussels, Belgium, EASAC Energy Steering Panel meeting, 9 October 2019
- Bergen, Norway, EASAC Working Group meeting 'Changes in Ocean Circulation', 22 October 2019
- Berlin, Germany, IAP Young Physician Leaders (YPL) Programme at the World Health Summit, 24-29 October 2019
- London, UK, UK AMS-IAP workshop 'Addressing the Social Determinants of Global Mental Health in the Sustainable Development Goals Era', 31 October - 1 November 2019

November
- Halle, Germany, inaugural 'Climate Change and Health' project meeting, 4-5 November 2019
- Xiamen, China, representation at 16th International Conference on Urban Health, 4-8 November 2019
- Herrenhausen, Germany, NASEM-EASAC-IAP workshop 'Arctic Warming and Microbial Threats', 6-7 November 2019
- Accra, Ghana, Annual Meeting of African Science Academies (AMASA-15), 13-16 November 2019
- Zagreb, Croatia, EASAC Council and Bureau meetings, 14-15 November 2019
- Accra, Ghana, NASAC General Assembly, 15 November 2019
- Accra, Ghana, NASAC-ISC 'Intensive Training Workshop on Trans-disciplinary Research', 18-19 November 2019
- Budapest, Hungary, Young Scientists Workshop and sessions at the World Science Forum, 19-23 November
- Accra, Ghana, NASAC-ISC Project Coaching Workshop, 20-22 November 2019
- Brussels, Belgium, EASAC Working Group meeting on 'Regenerative Medicine', 28 November 2019

December
- Geneva, Switzerland, side event at Meeting of the States Parties to the Biological Weapons Convention, 3-12 December 2019
- Irvine, USA, IANAS Water Programme Annual Meeting, 10-11 December 2019

Publications Supported by IAP in 2019

IAP Annual Report 2018
Published by: IAP
• www.interacademies.org/publication/iap-annual-report-2018

2019 IAP Conference Handbook
Published by: IAP
• www.interacademies.org/publication/2019-iap-conference-handbook

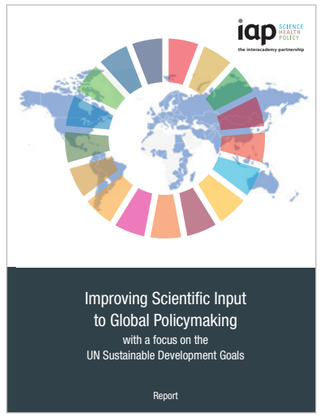
InterAcademy Partnership Strategic Plan (2019-2021)
Published by: IAP
• www.interacademies.org/publication/interacademy-partnership-strategic-plan-2019-2021

IAP Communiqué on Tropical Forests
Published by: IAP
• www.interacademies.org/publication/iap-communique-tropical-forests

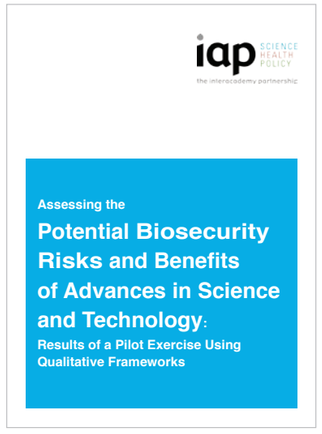
A Call for Action to Declare Trauma a Disease
Published by: IAP
• www.interacademies.org/statement/call-action-declare-trauma-disease

Un llamado a la acción para la declaración del trauma como enfermedad
Published by: IAP
• www.interacademies.org/statement/call-action-declare-trauma-disease

Improving Scientific Input to Global Policymaking with a Focus on the UN Sustainable Development Goals
Published by: IAP
• www.interacademies.org/publication/improving-scientific-input-global-policymaking-focus-un-sustainable-development-goals



Harnessing Science, Engineering and Medicine to Address Africa's Challenges: The role of African national academies
Published by: IAP
• www.interacademies.org/publication/harnessing-science-engineering-and-medicine-address-africas-challenges-role-african



Assessing the Biosecurity Risks and Potential Benefits of Advances in Science and Technology: Results of a pilot exercise using qualitative frameworks
Published by: IAP
• www.interacademies.org/publication/assessing-biosecurity-risks-and-potential-benefits-advances-science-and-technology

Merit-based Academies in the 21st Century: A think piece
Published by: IAP
• www.interacademies.org/publication/merit-based-academies-21st-century-think-piece

New Models for Science Diplomacy Transcending Boundaries: The InterAcademy Partnership Food and Nutrition Security and Agriculture project
Published by: IAP
• www.interacademies.org/publication/new-models-science-diplomacy-transcending-boundries-interacademy-partnership-food-and

Achieving Universal Health Coverage in LMICs: The role of quality of care research
Published by: UK Academy of Medical Sciences, IAP
• www.interacademies.org/publication/achieving-universal-health-coverage-lmics-role-quality-care-research

Recommendations and Conclusions from AASSA Regional Workshops and Meetings, 2019
Published by: AASSA
• www.interacademies.org/publication/recommendations-and-conclusions-aassa-regional-workshops-and-meetings-2019

Securing Asia's Food and Nutrition
Published by: AASSA
• www.interacademies.org/publication/securing-asias-food-and-nutrition

Food Systems for Delivering Nutritious and Sustainable Diets: Perspectives from the global network of science academies
Published by: IAP, EASAC
• www.interacademies.org/publication/food-systems-delivering-nutritious-and-sustainable-diets-perspectives-global-network

Global Food and Nutrition Security Needs More and New Science
Published by: IAP, EASAC
• www.interacademies.org/publication/global-food-and-nutrition-security-needs-more-and-new-science

Scientific Opportunities for Nutrition Security
Published by: IAP, EASAC
• www.interacademies.org/publication/scientific-opportunities-nutrition-security

Transforming Food Systems to Deliver Healthy, Sustainable Diets
Published by: IAP, EASAC
• www.interacademies.org/publication/transforming-food-systems-deliver-healthy-sustainable-diets-view-worlds-science

Decarbonisation of Transport: Options and challenges
Published by: EASAC
• www.interacademies.org/publication/decarbonisation-transport-options-and-challenges

Forest Bioenergy, Carbon Capture and Storage, And Carbon Dioxide Removal: An update
Published by: EASAC
• www.interacademies.org/publication/forest-bioenergy-carbon-capture-and-storage-and-carbon-dioxide-removal-update

Globalization of Traditional Chinese Medicine: What are the issues for ensuring evidence-based diagnosis and therapy?
Published by: EASAC
• www.interacademies.org/news/globalization-traditional-chinese-medicine-what-are-issues-ensuring-evidence-based-diagnosis

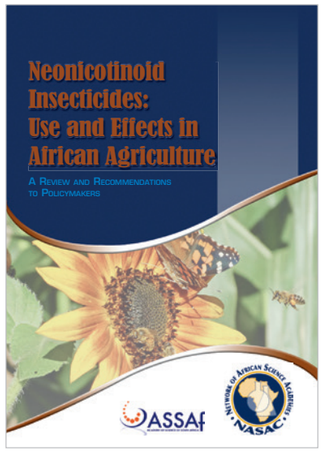
Serious Mismatches Continue Between Science and Policy in Forest Bioenergy
Published by: EASAC
• www.interacademies.org/publication/serious-mismatches-continue-between-science-and-policy-forest-bioenergy

The Imperative of Climate Action to Protect Human Health in Europe
Published by: EASAC
• www.interacademies.org/publication/imperative-climate-action-protect-human-health-europe

Urgent Action is Needed to Protect Human Health from the Increasing Effects of Climate Change
Published by: EASAC
• www.interacademies.org/publication/urgent-action-needed-protect-human-health-increasing-effects-climate-change

Traditional Chinese Medicine: A statement by EASAC and FEAM
Published by: EASAC, FEAM
• www.interacademies.org/publication/traditional-chinese-medicinea-statement-easac-and-feam

Neonicotinoid Insecticides: Use and effects in African agriculture - a review and recommendations to policymakers
Published by: ASSAf, NASAC
• www.interacademies.org/publication/neonicotinoid-insecticides-use-and-effects-african-agriculture-review-and



Water Quality in the Americas: Risks and opportunities.
Published by: IANAS
• www.interacademies.org/publication/water-quality-americas-risks-and-opportunities

M8 Alliance Statement: Beyond Silos
Published by: M8 Alliance
• www.interacademies.org/publication/m8-alliance-statement-beyond-silos

Declaration of the 9th World Science Forum 'Science Ethics and Responsibility'
Published by: Hungarian Academy of Sciences
• www.interacademies.org/publication/declaration-9th-world-science-forum-science-ethics-and-responsibility

Publications Supported by IAP in 2018

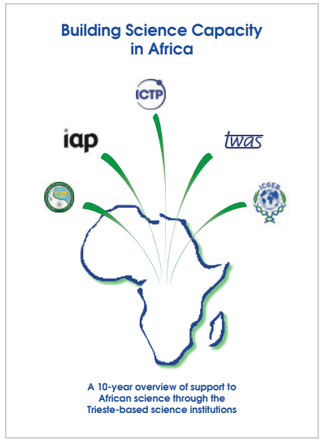
Included here to show complete outputs during the latest 3-year cycle linked to IAP general assemblies.

IAP Annual Report 2017
Published by: IAP
• www.interacademies.org/47264/IAP-Annual-Report-2017

Opportunities for future research and innovation on food and nutrition security and agriculture: The InterAcademy Partnership's global perspective
Published by: IAP
• www.interacademies.org/48898/Opportunitiesfor-future-research-and-innovation-on-food-and-nutritionsecurity-and-agriculture-The-InterAcademy-Partnershipsglobal-perspective

IAP S20 Statement on Food and Nutrition Security and Agriculture
Published by: IAP
• www.interacademies.org/47026/IAP-S20-Statement-on-Food-and-Nutrition-Security-and-Agriculture

Building Scientific Capacity in Africa
Published by: The World Academy of Sciences (TWAS) – for the advancement of science in developing countries, ICTP, ICGEB, Organization for Women in Science for the Developing World (OWSD), IAP Science
• www.interacademies.org/44155/Building-Scientific-Capacity-in-Africa



IAP Health - A call for action to tackle the growing burden of dementia
Published by: IAP Health
• www.interacademies.org/45731/IAP-for-Health-A-call-for-action-to-tackle-the-growing-burden-ofdementia

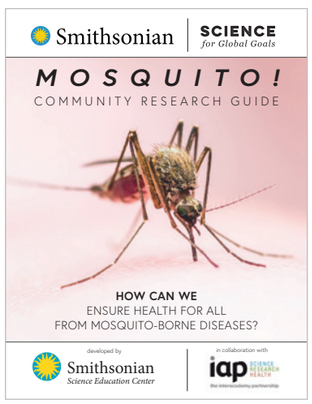
Challenges and priorities for global mental health research in low- and middle-income countries
Published by: UK Academy of Medical Sciences and IAP
• www.interacademies.org/48864/Challengesand-priorities-for-global-mental-health-research-in-lowand-middleincome-countries

Governance of Dual Use Research in the Life Sciences
Published by: US NASEM in cooperation with IAP, the Croatian Academy of Sciences and Arts, and the Croatian Society for Biosafety and Biosecurity
• www.interacademies.org/49130/Governance-of-Dual-Use-Research-in-the-Life-Sciences-

IAP SEP Islamabad Declaration 2018
Published by: IAP Science Education Programme
• www.interacademies.org/45938/IAP-SEPIslamabad-Declaration-2018

Mosquito! Community Research Guide - Spanish
Published by: Smithsonian Science Education Center in collaboration with IAP
• www.interacademies.org/47241/Mosquito-Community-Research-Guide-Spanish

Mosquito! Community Research Guide - English
Published by: Smithsonian Science Education Center in collaboration with IAP
• www.interacademies.org/47237/Mosquito-Community-Research-Guide-English



Profiles of Women Scientists in Asia
Published by: AASSA and IAP
• www.interacademies.org/49319/Profiles-of-Women-Scientists-in-Asia

Opportunities and challenges for research on food and nutrition security and agriculture in Asia
Published by: AASSA
• www.interacademies.org/45193/Opportunitiesand-challenges-for-research-on-food-and-nutritionsecurity-and-agriculture-in-Asia

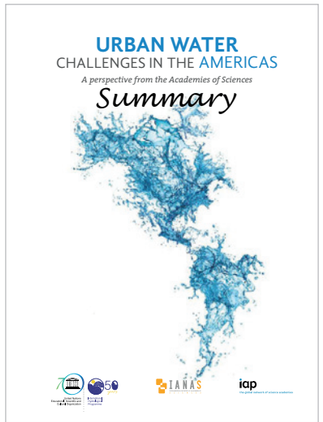
Negative emission technologies: What role in meeting Paris Agreement targets?
Published by: EASAC
• www.interacademies.org/43811/Negativeemission-technologies-What-role-in-meeting-Paris-Agreement-targets

Extreme weather events in Europe
Published by: EASAC
• www.interacademies.org/45335/Extremeweather-events-in-Europe

Opportunities for soil sustainability in Europe
Published by: EASAC
• www.interacademies.org/47678/Opportunitiesfor-soil-sustainability-in-Europe-

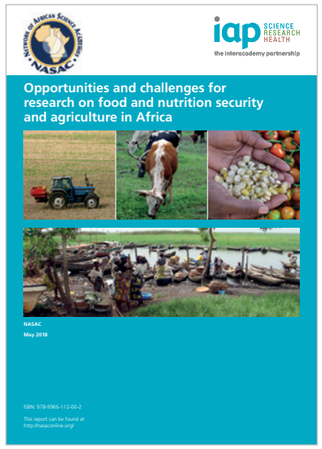
Opportunities and challenges for research on food and nutrition security and agriculture in the Americas
Published by: IANAS
• www.interacademies.org/45198/Opportunitiesand-challenges-for-research-on-food-and-nutritionsecurity-and-agriculture-in-the-Americas

Urban Water Challenges in the Americas: summary
Published by: IANAS
• www.interacademies.org/46701/Urban-Water-Challenges-in-the-Americas-summary



Women for Science: Census Update 2014-2016
Published by: IANAS
• www.interacademies.org/46707/Women-for-Science-Census-Update-20142016

Opportunities and challenges for research on food and nutrition security and agriculture in Africa
Published by: NASAC
• www.interacademies.org/46046/Opportunitiesand-challenges-for-research-on-food-and-nutritionsecurity-and-agriculture-in-Africa



Establishing a New-Vaccine Intelligence Unit in Ethiopia: Systematic Review and Policy Brief
Published by: the Ethiopian Academy of Sciences (with financial support from IAP)

Education Systems in Eastern Africa: Creating 'Trainable' Graduates for Development: A Forum on the Nexus of the Arts, Sciences, and Humanities (NASH) Consensus Study Report
Published by: the Uganda National Academy of Sciences, the Kenya National Academy of Sciences, the Tanzania Academy of Sciences and the Ethiopian Academy of Science (with financial support from IAP)

Publications Supported by IAP in 2017

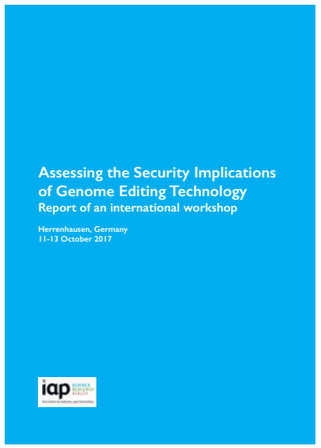
Included here to show complete outputs during the latest 3-year cycle linked to IAP general assemblies.

IAP Annual Report 2016
Published by: IAP
• www.interacademies.org/42235/IAP-Annual-Report-2016

IAP Statement on Climate Change and Education
Published by: IAP
• www.interacademies.org/38806/IAP-Statementon-Climate-Change-and-Education

IAP Statement on Science and Technology for Disaster Risk Reduction
Published by: IAP
• www.interacademies.org/36499/IAP-Statementon-Science-and-Technology-for-Disaster-Risk-Reduction

Assessing the Security Implications of Genome Editing Technology: Report of an international workshop
Published by: IAP
• www.interacademies.org/43251/Assessingthe-Security-Implications-of-Genome-Editing-Technology-Report-of-an-international-workshop



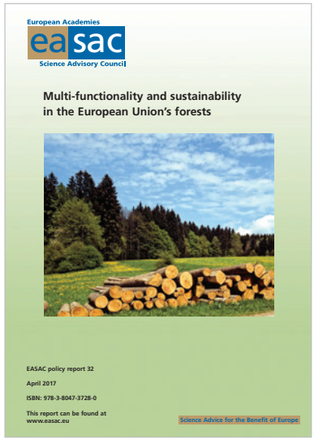
Supporting the Sustainable Development Goals: A guide for merit-based academies
Published by: IAP for Research
• www.interacademies.org/37864/IAP_SDG_Guide

Advancing Health and Wellbeing in the Changing Urban Environment
Published by: Springer
• www.interacademies.org/31495/Advancing-Health-and-Wellbeing-in-the-Changing-Urban-Environment

Opportunities and Challenges for Research on Food and Nutrition Security and Agriculture in Europe
Published by: EASAC
• www.interacademies.org/38802/EASACOpportunities-and-Challenges-for-Research-on-Food-and-Nutrition-Security-and-Agriculture-in-Europe-

EASAC statement on Homeopathic Products and Practices: Assessing the evidence and ensuring consistency in regulating medical claims in the EU
Published by: EASAC
• www.interacademies.org/37304/EASACstatement-on-Homeopathic-products-and-practicesassessing-the-evidence-and-ensuring-consistency-inregulating-medical-claims-in-the-EU

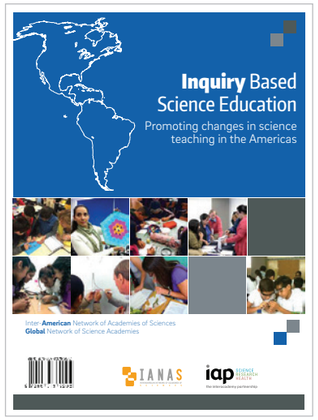
Multi-functionality and Sustainability in the European Union's forests
Published by: EASAC
• www.interacademies.org/31485/EASACMultifunctionality-and-sustainability-in-the-European-Unions-forests-



Challenges and Opportunities for Food and Nutrition Security in the Americas: The view of the academies of sciences
Published by: IANAS
• https://ianas.org/wp-content/uploads/2020/07/fnb02c-1.pdf

Retos y oportunidades de la seguridad alimentaria y nutricional en las Américas: El punto de vista de las academias de ciencias
Published by: IANAS
• https://ianas.org/wp-content/uploads/2020/07/fnb06b-1.pdf

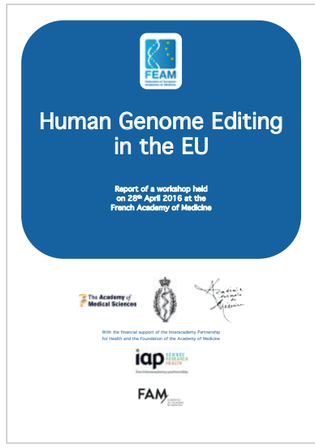
Inquiry Based Science Education: Promoting changes in science teaching in the Americas
Published by: IANAS
• www.interacademies.org/42440/Inquiry-Based-Science-Education-Promoting-changes-in-scienceteaching-in-the-Americas



Women In Science: Inspiring stories from Africa
Published by: NASAC
• www.interacademies.org/37298/NASACWomen-In-Science-Inspiring-Stories-from-Africa

Femmes en science: Histoires inspirantes issues de l'Afrique
Published by: NASAC
• www.interacademies.org/37298/NASACWomen-In-Science-Inspiring-Stories-from-Africa

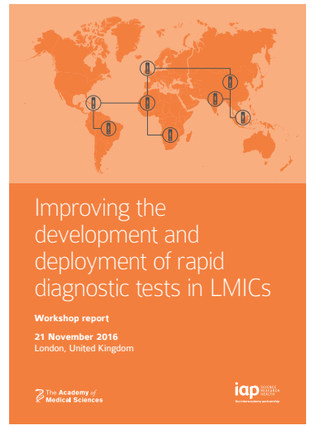
Human Genome Editing in the EU
Published by: FEAM
• www.interacademies.org/31271/FEAM-Human-Genome-Editing-in-the-EU



GloSYS ASEAN Report
Published by: GYA
• https://www.interacademies.org/publication/gya-glosys-asean-report

Strengthening Clinical Research Capacity in Low- and Middle-income Countries
Published by: Academy of Medical Sciences, UK, and IAP for Health
• www.interacademies.org/42431/Strengtheningclinical-research-capacity-in-low-and-middleincomecountries

Improving the Development and Deployment of Rapid Diagnostic Tests in Low and Middle Income Countries
Published by: Academy of Medical Sciences, UK, and IAP Health
• www.interacademies.org/31555/Improving-thedevelopment-and-deployment-of-rapid-diagnostic-tests-in-Low-and-Middle-Income-Countries



A Health Science Education Programme in Primary School (English version) - 3rd year
Published by: Accademia Medica di Roma
• www.interacademies.org/31644/A-Health-Science-Education-

Secretariat

The InterAcademy Partnership secretariat is hosted by The World Academy of Sciences (TWAS) in Trieste, Italy, and by the US National Academies of Sciences, Engineering and Medicine in Washington, DC, USA.

IAP Science and IAP Health

The World Academy of Sciences (TWAS)
ICTP campus
Strada Costiera 11
34151 Trieste, Italy

- Peter McGrath, *Coordinator*
- Muthoni Kareithi, *Administrative assistant*
- Sabina Caris, *Administrative assistant*
- Giovanni Ortolani, *Communications assistant*

Email: iap@twas.org

IAP Policy

The US National Academies of Sciences, Engineering and Medicine
500 Fifth Street, NW
Washington, DC, 20001, USA

- Teresa Stoepler, *Executive director*
- Nina Ward, *Programme associate*

Email: secretariat@iapartnership.org

IAP Policy project director: Tracey Elliott (UK)

Off-site support from the German National Academy of Sciences, *Leopoldina*: Johanna Mogwitz

Additional administrative support is provided by TWAS, especially Patricia Presiren, Nino Coppola and Ezio Vuck. Both TWAS and IAP are hosted on the campus of the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy.

@IAPartnership
www.linkedin.com/company/interacademypartnership
https://tinyurl.com/IAPyoutube

www.interacademies.org

The InterAcademy Partnership, Inc. is a 501(c)3 non-profit organisation, registered in Washington, DC, USA, as a public charity. Funds from the Government of Italy to support TWAS and IAP are provided to the United Nations Educational, Scientific and Cultural Organization (UNESCO), headquartered in Paris, France. Both TWAS and IAP (IAP Science and IAP Health) are considered 'programme units' of UNESCO, which provides administrative oversight for TWAS and IAP activities. IAP Policy is hosted by the US National Academies of Sciences, Engineering and Medicine (NASEM) in Washington, DC, USA, and receives core funding support from US NASEM.

iap SCIENCE HEALTH POLICY
the interacademy partnership

IAP Science and IAP Health
The World Academy of Sciences (TWAS)
ICTP campus • Strada Costiera 11 • 34151 Trieste, Italy
iap@twas.org

IAP Policy
The US National Academies of Sciences, Engineering and Medicine
500 Fifth Street, NW • Washington, DC, 20001, USA
secretariat@iapartnership.org

@IAPartnership
www.linkedin.com/company/interacademypartnership
https://tinyurl.com/IAPyoutube

www.interacademies.org