



3rd Worldwide Meeting of
National Young Academies

One Health – Health and Development

in the Context of an Urbanising Planet
and Implications for Science Policy

20 – 21 July 2017



science
& technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



GLOBAL
YOUNG
ACADEMY



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March 2018

ISBN 978-0-9947117-7-9

DOI <http://dx.doi.org/10.17159/assaf.2018/0022>

Published by:

Academy of Science of South Africa (ASSAf)
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The Academy of Science of South Africa (ASSAf) was inaugurated in May 1996. It was formed in response to the need for an Academy of Science consonant with the dawn of democracy in South Africa: activist in its mission of using science and scholarship for the benefit of society, with a mandate encompassing all scholarly disciplines that use an open-minded and evidence-based approach to build knowledge. ASSAf thus adopted in its name the term 'science' in the singular as reflecting a common way of enquiring rather than an aggregation of different disciplines. Its Members are elected on the basis of a combination of two principal criteria, academic excellence and significant contributions to society.

The Parliament of South Africa passed the Academy of Science of South Africa Act (No 67 of 2001), which came into force on 15 May 2002. This made ASSAf the only academy of science in South Africa officially recognised by government and representing the country in the international community of science academies and elsewhere.

This report reflects the proceedings of the 3rd Worldwide Meeting of National Young Academies on One Health – Health and Development in the Context of an Urbanising Planet and Implications for Science Policy held on 20 – 21 July 2017 at the Birchwood Hotel & OR Tambo Conference Centre, Boksburg, South Africa. Views expressed are those of the individuals and not necessarily those of the Academy nor a consensus view of the Academy based on an in-depth evidence-based study.



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One Health – Health and Development

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ACKNOWLEDGEMENTS

This report is the summary of the meeting proceedings of the Third Worldwide Meeting of National Young Academies which took place from 20 to 21 July 2017 at the Birchwood Hotel & OR Tambo Conference Centre, Boksburg, South Africa. This meeting was hosted by the South African Young Academy of Science (SAYAS) and co-organised by the Global Young Academy (GYA).

We wish to acknowledge funding received from the GYA, the World Academy of Sciences Regional Office of sub-Saharan Africa (TWAS ROSSA), the Organisation for Women in Science for the Developing World – South Africa National Chapter (OWSD-SANC), the National Research Foundation (NRF), the South African Medical Research Council (SAMRC), the International Council for Science – Regional Office for Africa (ICSU ROA), the InterAcademy Partnership (IAP), the New Zealand High Commission in South Africa, and the Volkswagen Foundation without which it would not have been possible to organise this meeting of Young Academies. Organisational support from the Academy of Science of South Africa (ASSAf) is also acknowledged.

We also thank all the meeting participants in their different roles, for enriching the discussions and sharing their experiences.

SAYAS recognises Ms Edith Shikumo, SAYAS Secretariat, and Ms Marvin Mandiwana, Liaison Team Assistant at ASSAf, in their various roles in organising this meeting.

The tireless work of the organising committee is also acknowledged. The committee comprised: Dr Sahal Yacoob, SAYAS Co-Chair; Dr Karen Cloete, SAYAS Co-Chair; Prof Tolullah Oni, SAYAS Member; Dr Moritz Riede, GYA Member and GYA Co-Chair; Prof Esther Akinlabi, SAYAS Member; Prof Makondelele Makatu, SAYAS Executive Committee Member (Exco); Dr Nosiphiwe Ngqwala, SAYAS ExCo Member; Mr Stanley Maphosa, ASSAf International Liaison Manager; Dr Mari-Vaughn Johnson, GYA Co-Chair; Dr Samuel Sojinu, GYA ExCo Member; Mr Kholani Mbhiza, TWAS ROSSA Secretariat; Ms Anna-Maria Gramatté, GYA Project Officer; and Ms Edith Shikumo, SAYAS Secretariat.

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EXECUTIVE SUMMARY

In July 2017, more than 60 representatives from over 35 Young Academies and similar young scientist initiatives from all over the world met in Johannesburg, South Africa at the third Worldwide Meeting of Young Academies with the title: One Health – Health and Development in the Context of an Urbanising Planet and Implications for Science Policy. The meeting, a first for the global South was hosted by the South African Young Academy of Science (SAYAS) and co-organised by the Global Young Academy (GYA). The aim of the meeting was to network young scientists and highlight the importance of their increased participation in science advice in support of policy development and to discuss the barriers to effective engagement. The meeting also served to underscore the role of National Young Academies of science (NYAs) as a mechanism for national implementation, capacity building and policy setting in respect of United Nations Sustainable Development Goals (SDGs).

Presentations made by several NYAs highlighted similarities in the composition of Young Academies and joint challenges faced. A common theme was their overarching role as providing and facilitating access to science and evidence-based policy advice and thereby promoting dialogue amongst different constituents. Some strengths identified included:

- i Convening power of Young Academies: This role was recognised by virtue of membership by a country's excellent young scientists. Though most NYAs had limited numbers in terms of membership, their recognition in a country's national system of innovation (NSI) could provide the impetus for engagement.
- ii Interdisciplinarity: The integration of a wide range of disciplines among the NYA membership gives room to create a powerful learning experience and emphasise integrative learning, critical thinking, and creative problem solving.
- iii Engagement with the public: This was through various fora such as school outreaches, summer schools and public competitions in order to make science accessible to the wider public as well as being social media-savvy.

As a meeting of NYAs, this meeting provided adequate opportunity to discuss young academy matters under the banner of 'Activities, Opportunities, Barriers, and their Future Impact' with a view to strengthening representative organisations through collective learning. It was important to underscore opportunities for future impact whilst also paying attention to barriers in order to address missed prospects.

Opportunities for NYAs

From the discussions, it was clear that NYAs are involved in a number of activities which have a common thread such as outreach, capacity building, and networking events for their members. NYAs can however achieve more and have a bigger impact by working together and collaborating on common themes. This may be subject to geographical blocs such as South African Development Community (SADC), European Union (EU), Association of Southeast Asian Nations (ASEAN) and others. Mentoring for initiating NYAs was also considered critical in terms of equipping them to grow and learn. One recommendation was that the idea of 'sister programmes' involving internal support and resources, and sharing best practices between new and well-established young academies should be pursued.

SDG and Policy Frameworks

A collaboration with the InterAcademy Partnership (IAP) sought to explore global policymaking in respect of the SDGs, science leadership and the role of NYAs and Policy Implementation of SDGs during the meeting. Opportunities were identified for added benefit in engaging in this exercise such as encouraging the collaboration and adoption of good practices among organisations that generate scientific advice and support as well as NYAs working in tandem with senior academies in order to mobilise, build capacity and cooperation towards achieving the SDGs. In this regard, knowledge transfer between generations and sectors as well as mapping strategic partnerships was explored. It was agreed that the science policy interface is crucial to identifying interlinkages between the SDGs, informing implementation and review at national level, and appropriately using science technology and innovations (STIs) as enablers for overcoming barriers to development. A key area that NYAs could explore is in ensuring a conducive institutional, regulatory, and policy environment which is crucial to make STIs effective tools towards the SDGs. Some tangible ways for the NYAs and the GYA to get more involved in SDGs policy implementation were suggested.

Young Scientists and Science Leadership

As a meeting of young scientists, it was imminent to discuss issues that young scientist and early career researchers face in the career pathing and development. The area of science leadership was also critical in order to equip young scientists to take up the mantle with the intention of enabling them to contribute to the development of a new paradigm for science globally.

During the event, the Global State of Young Scientists (GloSYS) Africa Survey was launched. GloSYS is one of the key projects of the GYA with the idea of creating evidence to demonstrate the challenges and motivations that shape the career trajectories of early-career researchers around the world. The results of the study are used to create policy recommendations aimed at improving the working conditions, support systems, and career prospects of young scientists. A global precursor study report, published in 2014, found that while mobility and innovation were improving, geographically-biased challenges remained. Recommendations that were made addressed improving mentorship and support structures, developing focused training programmes, improving the evaluation processes and working conditions, and rewarding commercialisation of the intellectual property (IP) of the research done.

The development of the Science Leadership Programmes (SLPs), another GYA key project, arose as a direct outcome from this study designed to address a key need for early career scientists. The successful Africa Science Leadership Programme (ASLP), co-developed by the University of Pretoria in South Africa and the GYA, is currently in its fourth cohort and is supporting the growth of mid-career African academics and equipping them to be science leaders. It is important for such programmes to be established globally.

Gender (Equality and) Equity in NYAs

Science academies are well placed to contribute towards the strengthening of NSI through advocating for an increased participation of girls and women in science. A partnership with the Organisation for Women in Science for the Developing World – South Africa National Chapter (OWSD-SANC) raised several questions for subsequent discussion on key areas to be taken into consideration (though not exhaustive) by NYAs which are of relevance to achieving gender equality and equity which were:

- Participation: Who is included in NYAs membership? What value would diversity and inclusion add to the functioning of the NYAs? Who sets the strategic tone in NYAs' agendas and who else should be part of this process? What role can the NYAs play in advocating for the increased participation of women and girls in respective country's science systems and in leadership and for gender diversity and inclusion in the individual NSI.
- Policy: Who serves in the NYAs research groups, panels and committees that result in policy recommendations to government? Is it diverse and inclusive, and if exclusive, what does this mean for the recommendations made to government? What role do young scientists

play in encouraging, promoting and supporting policymakers to have gender as part of policymaking?

- Research: How do NYAs encourage researchers who make up their membership to look at gender as part of their research and innovation leading to solutions that serve the needs, abilities and concerns of both women and men?
- Research and intersectionality: Who are young scientists addressing and whose problems are they solving in their research?

Challenges

In as much as there were clear opportunities for NYAs in addressing societal challenges, in the same vein however, there were some joint challenges faced, inclusive of:

- Lack of sufficient funding, office space and administrative support.
- Science leadership gaps.
- Various threats to science, for example decrease in trust in science or an increase in fake news and threats to academic freedom for example.
- Conflicting roles: As young scientists aim to climb the academic ladder, they are faced with competing administrative tasks that though necessary, may take away time from their research activities.
- Travel constraints and bans that affect attendance of international and regional networking sessions and conferences.
- Training in science policy and associated skills such as knowledge transfer, by employing a similar programme to the Africa SLP and in science communication.

Science Outreach

On the final day of the meeting, SAYAS and Jive Media facilitated a science outreach and engagement session involving a visit to the Tsakane African School of Excellence, which included science-based activities and an interactive session with young learners from two science clubs in Johannesburg, South Africa. Many Young Academies are running dedicated outreach programmes, as outreach and engagement connects the public to the fun and excitement of science. It enables scientists to share their research and discuss scientific issues with the public in an accessible way. It also cultivates an interest and appreciation of science in young learners and science, technology, engineering and mathematics (STEM) uptake.

Young Academy Statement

The meeting's discussion and activities culminated in a conference statement on "The role of Young Academies in achieving the UN SDGs". It concluded that Young Academies can and should play a central role in conceptualising, developing and implementing strategies to achieve the SDGs. Policymakers working on the SDGs and senior Academies were urged to act on their proclamation that 'young people are key drivers of sustainable development' and to increasingly seek and include advice from Young Academies. The statement also gave agreed-on areas in which Young Academies around the world could contribute successfully to national, regional and global SDG processes using science, research and innovation.

CONFERENCE STATEMENT

3rd Worldwide Meeting of Young Academies Statement

The role of Young Academies in achieving the UN SDGs

October 2017

Preamble

In July 2017, more than 60 representatives from over 35 Young Academies and similar young scientist initiatives from all over the world met in Johannesburg, South Africa. This Third Worldwide Meeting of Young Academies focused on the question of how young academies in general, and young scientists in particular, can contribute to the achievement of the UN Sustainable Development Goals (SDGs). Participants discussed the role of Young Academies in the national implementation of the SDGs, and how science and technology can best be harnessed towards achieving the SDGs.

We concluded that Young Academies can and should play a central role in conceptualising, developing and implementing strategies to achieve the SDGs. We urge policy-makers working on the SDGs and Senior Academies to act on their proclamation that 'young people are key drivers of sustainable development'¹ and to increasingly seek and include advice from Young Academies. As members of Young Academies, we are willing and ready to contribute to achieving the SDGs and, to this end, have identified the following areas for engagement:

Policy Advice

Achieving the goals of sustainability and poverty reduction will require a concerted effort by all sectors of society. Science has a crucial role in this effort and its central role must be recognised and utilised in achieving the SDGs and in monitoring their implementation.

We believe that the members of Young Academies, whether national, regional or global, are well placed to contribute interdisciplinary science advice to SDG implementation: they are typically not working in disciplinary silos, but looking together at societal challenges, they embrace diversity (cultural, disciplinary, gender, etc.) and connect scientists across borders due to their regional and global networks. Thus, we recommend that Young Academies should take on a science advisory role at a national, regional and global level. By becoming recognised as an independent part of their national, regional and global policy

¹ UN General Assembly, 69th Session, High-Level Event for World Programme of Action on Youth, 29 May 2015. Online: <https://www.un.org/press/en/2015/ga11648.doc.htm>

advice systems, Young Academies and their members can play an important role as trusted intermediaries between the research community and policy-makers and provide research-based evidence for SDG implementation and indicators for monitoring and evaluation. This would ensure inclusion of perspectives of young scientists at the national and global science-policy interface and strengthen the scientific base of the SDG process.

Science Communication and Outreach

We see Young Academies as strategically well positioned to raise awareness and understanding of the SDGs and related science issues within their nations by communicating them to civil society, policy-makers, the private sector and wider public through workshops, lectures, and outreach programmes. By engaging with schools and universities on the SDGs, they can reach out to the next generation of future scientists.

Moreover, Young Academies can assist the media in building science literacy on the SDGs as well as confidence in science by contributing to science articles in the popular media and online.

Through all these activities, Young Academies can play a crucial role in demystifying science to the public by communicating research clearly and accessibly, thereby increasing public trust in science, unmasking fake news, and exposing infringements on academic freedom.

Capacity Enhancement for Young Scientists and Young Academies

An important part of the work of Young Academies is making the SDGs more familiar to our members. By helping each other to gain a better understanding of policymaking processes and evidence-based policymaking, as well as how to apply the UN policy framework to joint collaboration in the field of SDG implementation and monitoring, our work will be more effective and efficient.

Young Academies can achieve this by aligning ongoing academy activities and working groups with the SDGs, focusing on these goals in meetings and workshops (e.g. 2018 Africa Young Academies Regional Conference, 2019 Worldwide Meeting of Young Academies), looking at ways to incentivise young researchers to get involved, and by collaborating with Senior Academies, international science networks and other stakeholders.

One potential avenue, we suggest, is that Young Academies strengthen their engagement with the InterAcademy Partnership and their SDG-related project on "Improving Scientific Input into Global Policymaking: Strategies for Attaining the Sustainable Development Goals", and their African SDG project on "Harnessing

Science, Engineering and Medicine to Address Africa's Challenges", to learn about pathways into the UN science-policy interface.

In summary, we believe that Young Academies around the world can contribute successfully to national, regional and global SDGs processes using science, research and innovation. Engaging with our partners, in particular Senior Academies, we can leverage science to attain evidence-based policymaking and to deliver tangible outcomes on the livelihood of societies. To achieve this, we will continue encouraging, training and supporting our members and each other around the globe to be involved in national, regional as well as international, interdisciplinary, and intergenerational SDG-related dialogues and undertakings, and to work towards embedding the voice of young scientists in any proposed solution for achieving inclusive sustainability. We now urge SDG policy-makers and Senior Academies to work with us. We can achieve more by coming together and working jointly towards a "global science" driving sustainability.

Ratified by the Global Young Academy and the Albanian Young Academy of Sciences, Jonge Academie (Belgium), Burundi Council of Young Scientists, College of New Scholars, Artists and Scientists of the Royal Society of Canada, Young Academy of Denmark, Egyptian Young Academy of Sciences, Ethiopian Young Academy of Sciences, Indian National Young Academy of Science, Indonesian Young Academy of Sciences, The Israel Young Academy, The Young Academy of Japan, Kenya National Young Academy of Sciences, Young Korean Academy of Science and Technology, Association of Latvian Young Scientists, Young Scientists Network-Academy of Sciences Malaysia, De Jonge Akademie (NL), Nigerian Young Academy, The Young Academy of Norway, National Academy of Young Scientists (Pakistan), Philippine Academy of Young Scientists, The Polish Young Academy, The RSE Young Academy of Scotland, Académie Nationale des Jeunes Scientifiques du Sénégal, South African Young Academy of Science, Sri Lankan Academy of Young Scientists, Sudanese Academy of Young Scientists, Young Academy of Sweden, Thai Young Scientists Academy, Uganda National Young Academy, Council of Young Scientists at the Women Scientist Association of Uzbekistan, Vietnam Young Academy, Zimbabwe Young Academy of Science, Jmimi Talla Mbé representing the Cameroon Academy of Young Scientists initiative, Gergely Toldi representing the Young Academy initiative in Hungary, Vidushi Neergheen Bhujun representing the initiative of Young Academy in Mauritius, Meghnath Dhimal representing the Young Academy initiative in Nepal.



SESSION 1 ● ● ● ● ●

OPENING CEREMONY (FACILITATOR: DR KAREN CLOETE, SOUTH AFRICAN YOUNG ACADEMY OF SCIENCE (SAYAS) CO-CHAIR, RESEARCHER, MATERIAL RESEARCH DEPARTMENT, ITHEMBA LABS)

Welcome (Dr Karen Cloete, SAYAS Co-Chair)

Dr Cloete extended a warm welcome to all the leaders and representatives of young academies, sponsors and other delegates, many of whom had travelled far to be part of this meeting. SAYAS and the Global Young Academy (GYA) have the pleasure of hosting this 3rd Worldwide Meeting of National Young Academies (WWMNYA) in South Africa and acknowledged the hard work by the organising committee to make the event possible.

The aim of the meeting was to engage young scientists on the importance of their increased participation in science advice in support of policy development and to discuss the barriers to effective engagement. A statement would be released after the meeting on the National Young Academies of Sciences' (NYAs) role in realising the UN Sustainable Development Goals (SDGs).

Dr Cloete encouraged delegates to take the opportunity to learn from one another, be inspired by one another and create long-lasting relationships and friendships with young scientists from around the globe.

Opening Remarks (Dr Beate Wagner, Managing Director, GYA, Prof Moritz Riede, GYA Co-Chair, Associate Professor, Department of Physics, University of Oxford, United Kingdom (UK))

Dr Wagner welcomed the delegates to the 3rd Worldwide Meeting of National Young Academies. She emphasised that strengthening the development of young academies worldwide was not a task of the GYA alone, but part of the young academy movement worldwide. The meeting in South Africa was the first to take place in the global South and was anticipated to be particularly inspiring and fruitful.

Prof Riede thanked all the delegates for their presence at the meeting and looked forward to interesting discussions.

Keynote Address: Implementation of Regional and Global Policy Frameworks: The Role of Scholarly Academies both Senior and Young (Prof Robin Crewe, InterAcademy Partnership (IAP) Project Co-Chair, Past-President of the Academy of Science of South Africa (ASSAf) and Network of African Science Academies (NASAC))

NYAs play a very important role in influencing policy development and providing advice to national governments. However, NYAs are presented with two challenges as they chart their way to future initiatives. The NYA movement is still in its early days and will have to deliberate on how to solidify its influence on its own members and societies. All academies have to confront what it means to be either a Young Academy or a National Young Academy in the 21st century. The weight of a long history may not be helpful in charting the future. The second challenge relates to the climate in which the work of the academies will be undertaken. It is necessary to be aware that the vision that the academies have of their work might not be in favour with the politicians that they wish to influence. Offering policy advice in the political domain is potentially a massive test of diplomacy and advocacy skills.

IAP, the global network of science academies, recently initiated two projects with funding from the Carnegie Corporation. The aim of the Global Project is to improve the scientific input to global policymaking and strategies for attaining the SDGs. The African Project, co-chaired by Prof Crewe and Prof Oyewale Tomori, is titled, Harnessing Science, Engineering and Medicine to Address Africa's Challenges. The individuals participating in these projects are drawn from a variety of different academies across the world, with the NYAs playing a significant role. These projects are looking for opportunities to assist with implementing the SDGs through the United Nations (UN), which has well-developed mechanisms for offering advice, such as the UN Inter-Agency Task Team, the UN Science, Technology and Innovation (STI) Multi-Stakeholder Forum and an Online Platform, which could be used to create spheres of influence for the National Academies and the Young Academies. A whole range of international science and policy organisations are involved in offering advice and input to UN activities.

The Global Project conducted a survey of all academies (2016/17) in order to get a better understanding of how the academies could exercise their influence. Of the 88 academies that participated in the survey (23% of the responses came from Africa), most indicated that they were already playing an advisory role, especially at national level, and that they were keen to support the SDGs. They identified a number of areas in which the interaction

between individuals operating in this environment was not optimal and indicated that they had contributed to knowledge about the SDGs.

Some of the outcomes of the survey were:

- Academies viewed their roles as providing and facilitating access to evidence for achieving the SDGs; as interlocutors between policymakers and the research community; as originators of evidence-informed recommendations for policy; convening different constituencies and promoting dialogue, and as nominators of experts to participate in various working groups.
- Additional roles of academies were: championing coherent research policies; providing perspectives; exploring gaps, trade-offs and complementarities; capitalising on their regional and global networks; promoting the importance of the SDGs; monitoring and evaluating progress of the SDGs, and horizon scanning to identify future challenges and anticipate obstacles.
- The largest proportion of the work done by academies related to national, as well as regional/global priorities.
- Many academies did not measure the impact of their work.

The core objectives of the Africa Project are to:

- Mobilise African leaders in science, engineering and medicine in developing and implementing new approaches to addressing shared challenges.
- Strengthen merit-based academies in Africa as effective civil society organisations and respected sources of evidence-informed advice to their societies.
- Build stronger, sustained linkages/partnerships between African NYAs and global expertise to address Africa's challenges.

The project's work streams are:

- Survey and landscaping work within Africa.
- Engaging the diaspora.
- Developing science leadership programmes for young scientists.
- Exploiting African Union/New Partnership for Africa's Development (AU/NEPAD) opportunities to influence the development of STI on the continent.
- Small grants programme (allows academies to get together to address regional issues).

The small grants programme working group identified projects that are led by the NYA Initiative from Morocco, the Nigerian Young Academy, SAYAS and the Uganda National Young Academy, with participation of a number

of senior National Academies of Science, working as a consortium to jointly address a particular issue that they identified as important in that region. There is substantial interest in the outcome of the small grants projects, particularly in terms of establishing relationships amongst the participating academies. The desired outcomes of the Africa Project are:

- All academies make a proactive (potentially systemic) contribution to (facilitating) the national implementation of regional and global policy frameworks.
- Underrepresented research communities have a voice through their academies.
- A few examples of good practice are developed or scaled up.
- Build capacity and attract more funding for sustained follow-up work by African academies.

Challenges facing the NYAs relate to how they currently engage with the SDGs, where they see their major opportunities to have an impact, how they could generate ideas to help participants to become advocates for SDGs and agents for engagement and change.

The Africa Project representatives are Prof Robin Crewe, Dr Tracey Elliott (IAP Project Director) and Prof Dr Peter Fritz (Member of IAP Global and Africa Projects).

Questions

Dr De Ming Chau: What is the amount of the 'small grants' and how long does a project run? Are you aware of similar funding opportunities for the Southeast Asian countries?

Response, Prof Crewe: The grants are for 25 000 USD for each project. He was not aware of any other funding of a similar nature. IAP also funds activities by various academies and specifically funds regional networks.

Dr Binyam Sisay Mendisu: Prof Crewe's point that policy advice requires diplomacy and advocacy is appropriate. Do young scientists need a special set of skills to be effective in this area?

Response, Prof Crewe: One of the advantages of academy membership is understanding what individual members' skills are. Those members that have the persuasive skills to engage effectively with politicians must be identified and used in the engagement. Tenacity is also necessary when dealing with policymakers. Some advice only becomes implementable in a suitable political climate.

Dr Siyavuya Bulani: The International Network for Government Science Advice (INGSA) has just formed an African National Chapter. This is important because it provides the platform for scientists to give policy advice to government. ASSAf uses this as one of its platforms for example.

NYA Presentations (Facilitator: Dr Samuel Sojinu, GYA ExCo Member)

Azerbaijan – Young Scientists and Specialists Council (YSSC) Azerbaijan National Academy of Sciences (ANAS) (Mr Farid Seyfullayev)

The YSSC was established in 2013 by ANAS and has about 3 000 members from 42 ANAS institutes and universities. Most activities relate to projects with schools to promote and popularise science, and encourage learners to develop an interest in science as a career. Learners give presentations on various scientific topics. Seminars on a variety of topics are hosted by different universities and awards are offered for research. Senior and esteemed scientists are invited to present their research and share their experiences with the YSSC members. International scientific forums and conferences in a variety of disciplines are hosted by the YSSC and ANAS.

Germany – Junge Akademie (Dr Marion Schulte zu Berge)

The German Young Academy (*Junge Akademie*) was founded in 2000 by the Berlin-Brandenburg Academy of Science and Humanities (BBAW), and the German National Academy of Sciences Leopoldina. The young academy aims to advance interdisciplinary research, promote science-society dialogue, contribute to science policy debates, foster international cooperation and recruit, support and develop its members.

Fifty members are elected for a term of five years and members are recruited from both academic and artistic disciplines. The academy which is hosted by BBAW and Leopoldina but can act autonomously, is chaired by a board comprising five members elected annually and holds three plenary sessions each year. The current research groups are very diverse and address topics of interest to the members. The academy's science policy research group is well recognised.

Each year, the academy puts together a calendar which serves to introduce the work of its members and research questions addressed by them as a means to make science and the work of the academy more accessible to

¹ See the GYA website to access NYA and similar bodies websites: <https://globallyoungacademy.net/national-young-academies/>

the public. A short film competition was organised last year with the aim of enhancing interaction between scientific and artistic disciplines, as well as academies. As part of reaching out to and working with other academies, a joint symposium was held with the Israel Young Academy in 2015 and in 2016, an international conference was hosted in Mexico.

Poland – Polish Young Academy (AMU) (Prof Monika Kędra)

AMU was started by the senior academy, the Polish Academy of Sciences (PAS), in 2010. AMU which is part of PAS has its members (a maximum of 35), elected by PAS members from five disciplines which are: Humanities and Social Sciences, Biological and Agricultural Sciences, Mathematics, Physics, Chemistry and Earth Sciences, Engineering Sciences and Medical Sciences. AMU meets at least once a year for its annual general meeting, receives funding from PAS and decides which activities it wants to undertake.

The objectives of AMU are:

- Providing opinion statements and running programmes related to research.
- Organising debates, discussions and research conferences aimed at discussing significant scientific problems.
- Disseminating results of the above activities.
- Preparing opinions and scientific evaluations.
- Disseminating ethical standards among young scholars.

Some of the activities during 2016-2017 included:

- 1 Providing opinions on new legislations, of which some have been taken into account by government, and recommendations for lawmakers.
- 2 Meetings with the Policy Support Facility experts organised by the Polish Ministry of Science and Higher Education and a series of meetings and consultations with the Polish Ministry of Science and Higher Education, proving that AMU can be a platform for young scientists interested in working with policymakers.
- 3 Organising debates, discussions and research conferences, including the bi-annual Polish Scientific Network, and, together with PAS, host a conference to discuss challenges, future directions and reforms relating to science and education.
- 4 Running summer schools for PhD students and science festivals as part of public outreach.
- 5 International collaborations, such as participation in the European Young Academies Meeting, the GYA meeting and the Annual Celebration of the German *Junge Akademie*.

The challenge of retaining institutional memory and transferring knowledge and experience to each cycle of new members was addressed by staggering the intake of new members, which ensured continuity. It is more difficult for the small group of AMU members (currently at 15) to undertake the numerous activities.

Sri Lanka – Sri Lankan Academy of Young Scientists (SLAYS) (Dr Tharanga Thoradeniya)

SLAYS's motto is "March with intent and research with impact".

It was initiated under the umbrella of the National Academy of Sciences of Sri Lanka (NASSL) but functions independently. It currently has 59 members of which 23 are male, representing a wide range of disciplines. SLAYS also has associate members who are PhD students that engage in science in order to contribute to society. They are able to become full members after completion of a PhD and some years of working with SLAYS.

SLAYS collaborates with NASSL, the National Science Foundation of Sri Lanka and the Coordinating Secretariat for Science, Technology and Innovation (COSTI). Collaborative projects with the NASSL include:

- Science Conference for the Science Council of Asia 2016.
- Leadership training programme.
- Online platform for young scientists to interact and voice their challenges.
- A possible IAP grant in collaboration with the Nepal Academy of Science and Technology to develop and pilot a toolkit to empower young scientists, in particular women scientists in South Asia, to overcome challenges they face.
- Hosting the South Asian Biotechnology Conference in 2018.

SLAYS undertakes several outreach programmes in collaboration with the private sector to promote science to the public and inspire young minds, and to address the country's problems. Some of the projects involve writing books for children in different areas of science and the popularisation of science in mother tongue languages.

The highlight of 2016 was the SLAYS Forum, a collaborative effort with the National Science Foundation of Sri Lanka and COSTI, with financial support from the private sector. It was an international event attended by high-level Sri Lankan delegates with significant participation from young scientists. The forum opened the door to support for SLAYS projects and provided

opportunities for young scientists to interact with eminent scientists and to participate in a Three Minute Thesis (3 MT) competition.

SLAYS has to motivate young scientists to become members of the academy as they tend to pursue their own career goals and neglect the responsibilities they have as scientists. Fundraising is another challenge faced by SLAYS.

Sweden – Young Academy of Sweden (Prof Helena Filipsson and Dr Robert Lagerström)

The Young Academy of Sweden is independent from the senior academy and is dependent on funding from private sponsors. It is an interdisciplinary forum for a selection of the most talented young researchers in Sweden and aims to:

- Bring together prominent young scientists from various scientific disciplines to spark new ideas.
- Inspire children and young people to become interested in science and research.
- Inspire, promote and disseminate knowledge of science and research.
- Advise decision-makers and politicians to influence current and future research policy.

Membership of the academy is open to young researchers in all scientific fields and requires scientific excellence, engagement and independence, and is for a period of five years. Currently there are 34 members, with an equal number of males and females.

The academy meets four times a year and has standing committees for interdisciplinarity, outreach and science policy. The committees are involved in a range of activities including:

- Seminars on promoting interdisciplinary research in general and a tour on ethics in science.
- Setting up the L'Oréal-United Nations Educational, Scientific and Cultural Organisation (UNESCO) Award for Women in Science in Sweden.
- Writing books about how members became researchers.
- Holding competitions for the public and awarding prizes.
- Summer schools for high-school students, addressing science in general and how to become a scientist. Attracting students from diverse backgrounds has been a challenge.
- Reaching out to government to offer advice with regard to research policy. Writing groups prepare opinion pieces for the major newspapers on Bills addressing certain scientific topics, in a proactive way.

- A very successful networking programme where academy members are twinned with members of parliament in order to gain insight into each other's activities.
- Various international activities such as hosting the previous WWMNYA meeting in 2015 and collaborating with the GYA.

The Young Academy of Sweden seeks to collaborate more with other young academies.

South Africa – SAYAS (Dr Sahal Yacoob)

SAYAS was established in September 2011 with 20 founding members, under the auspices of ASSAf in partnership with the South African Department of Science and Technology (DST). Ten new members are inaugurated each year through a nomination and selection process. In addition to scientific merit, new members must show a commitment to driving social change and be under 40 and within seven years of obtaining a PhD when joining SAYAS. Current membership is made up of 45% males and 55% females.

SAYAS aims to:

- Be the voice of young scientists in South Africa.
- Contribute towards solutions to national and global challenges facing society.
- Be a platform for young scientists to influence policy decisions.
- Contribute towards the development of scientific capacity in South Africa through mentoring and role modelling.

SAYAS core programmes and related activities are:

- Improving the Scholarly Environment: Holding scientific conferences for knowledge exchange, producing workshop and proceedings reports, and writing books on young scientists' experience of research in South Africa.
- Promoting Science and Society: Holding the Annual Young Scientist Conference in partnership with ASSAf, DST and other partners, hosting regular symposia reaching outside of the academy and participating in global meetings such as the Brazil, Russia, India, China, South Africa (BRICS) Young Scientist Conclave Meetings and the World Economic Forum (WEF) Young Scientists' programme.
- Policy influencing: Participating in ASSAf's Standing Committees, which provide science-based advice to government, and making statements on topical issues.
- Feeding the pipeline: SAYAS female members participate as mentors in

the 1000 Futures –1000 Girls Programme. Outreach to schools to increase science, technology, engineering and mathematics (STEM) uptake and interest among young scholars, and visiting universities to encourage and promote membership of SAYAS.

- Raising awareness: Using social media and the SAYAS Blog, and through involvement in *Quest: Science for South Africa* magazine and the *South African Journal of Science* (SAJS) editorial teams.

Opportunities presented to SAYAS include:

- Advancing the voice of young scientists in South Africa.
- Furthering its impact by helping to initiate NYAs within the Southern African Development Community (SADC) region.
- Initiating joint activities with NYAs within the SADC region to tackle issues of joint concern.
- The excellent working relationship with ASSAf that hosts the Secretariat and provides support to enable SAYAS leverage on other opportunities.

SAYAS' biggest challenge currently is the lack of assured funding to allow the academy to plan for and undertake long term and impactful projects.

Discussion

Dr Robert Lagerström: The Junge Akademie's idea of a short film festival is a good one. How did you reach out to filmmakers to get contributions of films for the festival?

Response, Dr Marion Schulte zu Berge: We worked with the organisers of a large-scale short film festival that takes place in Berlin each year and they have connections with filmmakers across the world. We disseminated the 'call for short films' through them and our partners in the film business. The theme of the festival was deliberately not well defined and we received a very wide range of topics, which made the festival interesting.

Prof Anneline Bredenoord: What is the German Young Academy's experience with including artists in their programmes?

Response, Dr Marion Schulte zu Berge: We included artists from the very beginning. While this had benefits to the academy, it also had challenges because the criteria had to be very different and the type of work that artists do is very different from that of scientists. This is an important factor within the academy as it forces members to have certain discussions, about what is a valuable project for example.

Prof Anneline Bredenoord: Some of the academies showed significantly more female than male members. What are the reasons for this because in the Netherlands we have the opposite problem?

Response, Dr Tharanga Thoradeniya: In Sri Lanka there are fewer male academics in some areas of science. Former presidents of SLAYS are females. We are trying to be more inclusive and to get more male members.

Response, Prof Monika Kędra: The Polish Academy of Sciences has less than 10% female members, while AMU has more than 50% female members and all the chairs are female.

Delegate (name not captured): Mr Seyfullayev mentioned that the YSSC has 3 000 members. How are they selected?

Response, Mr Farid Seyfullayev: Each institute of the ANAS has its own Young Academy with about 10–20 members (there are 42 institutes). The members are active young scientists from the institutes. They may hold a bachelor or Master's degree or a PhD and do not necessarily have to be PhD holders only. One should however be an active member.

Delegate (name not captured): Why limit membership to 50 in countries where there are many universities and research institutions?

Response, Dr Sahal Yacoob: It makes sense to have a small group of members because we want to be seen as elite but representative, and because our membership is only for five years, we are very motivated to drive programmes. However, SAYAS might want to discuss this matter.

Ms Phatsimo Matshediso: How do academy members cope with having a full-time job as well as being active in their academy?

Response, Prof Helena Filipsson: The Young Academy of Sweden has a chief executive officer, a communications officer and a project assistant who help us a lot and allow researchers to focus on the activities and not administration. Being the chairperson (and vice-chairperson) is a lot of work and we are paid a small stipend. We do this as part of our job. This requires that one cannot be too young and must be beyond the stage of setting up as an independent researcher.

Dr Monir Uddin Ahmed: It is necessary for the academies to have good leadership in order to be able to be effective in influencing policymakers.

SESSION 2 ● ● ● ● ●

THEME 1: THE ROLE OF NYAs AS A MECHANISM FOR NATIONAL IMPLEMENTATION, CAPACITY BUILDING AND POLICY SETTING IN RESPECT OF SDGs 3, 8 AND 11 (FACILITATOR: DR TRACEY ELLIOTT, PROJECT DIRECTOR, IAP)

Science and Health: Shaping Policy through the Bottom-up Approach – An Example from the AMU Experience (Prof Monika Kędra, AMU)

AMU promotes the latest scientific discoveries among young scientists and the general public, presents opinions on the proposed legislation related to science, works closely with Polish Academy of Sciences (PAS) and other science-related governmental and non-governmental organisations (NGOs).

In terms of SDG 3 – Ensure healthy lives and promote well-being for all at all ages, AMU actively participates in health-related science dissemination and outreaches to the general public through conferences, open lectures and workshops to promote awareness of disease and human health. AMU also assists in developing information policy aimed at improving public health in Poland.

Individual AMU members lead outreach activities and are assisted by other members. Many activities are in collaboration with other science-related organisations. Events are adjusted depending on the composition of the group which includes participants of different ages, from schoolchildren to seniors, as well as different academic levels. Some examples of activities organised by AMU in recent years are:

- Conference on Megacities of the Future, held in Warsaw in 2014, which addressed health issues (age and lifestyle) of inhabitants of large cities, with participation from scientists, security experts, spatial planners and town planners.
- Educational and promotional activities, including a series of interactive open lectures about the digestive system and about threats related to unhealthy lifestyle of future mothers, a workshop about DNA and advanced molecular biology techniques, a display presenting the potential use of optical fibre in food products and diagnostics of a digestive system and a presentation on current neuropsychological and cognitive psychology knowledge about self-awareness.

AMU co-organises Polish Scientific Networks (PSN) conference, a joint effort of several major Polish science organisations and the Polish Ministry of Science and Higher Education. The next conference in the PSN series will take place in June 2018 and will focus on Science and Medicine. Keynote lectures will be given by world-renowned scientists from the United States of America (USA), UK and Poland. The programme will include networking sessions addressing the commercialisation of science and planning the transition from science to business, as well as fostering new collaborations. Panel discussions will address the social responsibility of researchers, mentoring, interdisciplinary collaboration and career opportunities in Poland and abroad.

Over the years, AMU has become more successful in reaching various groups of citizens (although mainly in the large cities) by adjusting the format of activities to appeal to specific audiences. A variety of strategic partners and other scientific organisations have played an important role in assisting AMU in organising scientific conferences and workshops and enhance its capacity to influence legislation. AMU provides an opportunity for knowledge transfer between generations by involving PhD students and postdoctoral students in its activities.

Challenges faced by AMU include limited funding, lack of adequate time and leaders to respond to the demand for outreach events and scientific conferences and difficulties in communicating science through the press. The era of fake news is a challenge for scientists' role in promoting science among all groups of citizens. Interpretation of the latest science discoveries should be available to everyone in order for appropriate decisions to be made about the uptake of science. AMU's educational efforts are crucial for the entire population but currently mainly reach those in the larger cities. More efforts are needed to reach out to those in smaller towns and the countryside, possibly through social media.

The Emerging Role of the Young Scientist Network – Academy of Sciences Malaysia in Bridging Science and Policy in Malaysia (Dr Chai Lay Ching, Young Scientists Network-Academy of Sciences Malaysia (YSN-ASM))

The YSN was established in 2012 under the auspices of the ASM to be the platform for the young scientific community to advance science in Malaysia and become a significant global contributor. The YSN-ASM currently has 57 members selected by a committee of the ASM based on scientific merit and commitment to serve for a three-year term. In addition to the full members, the YSN-ASM also has 47 affiliate members who are nominated by YSN-ASM members.

YSN-ASM's strategic plan 2016-2018 ensures that initiatives are focused on and in line with the national science policy. Several working groups were formed in order to bring the strategic plan into action. The plan identifies four major stakeholders:

- Scientists: Positioning the role of young scientists as a strategic partner in policymaking and implementation in the country.
- Research, development, commercialisation and innovation ecosystem: Fostering responsible and excellent science that creates value.
- Society: Raising societal interest in science and appreciation of the impact of science excellence.
- Global: Disseminating national efforts through regional and international discourse.

The role of the YSN-ASM towards building an inclusive and sustainable future in terms of the national science agenda includes:

- Science leadership and policy: Members are actively involved and invited to participate in science policy discussions.
- Engagement in national STI policy advice, development and action plans: Members are actively involved with the senior academy in studies on the country's science policy and conduct research on policy implementation.
- Young scientists from the Association of Southeast Asian Nations (ASEAN) countries participated in the Science Leadership Programme² which aims to advance a curriculum for academic leadership development.
- Science education, communication and outreach activities include:
 - o Co-organising the National Science Challenge, a nationwide competition to promote science among students. This has had excellent participation from across the country and offers prizes such as attendance of the Nobel Award Ceremony in Stockholm and study visits to Japan.
 - o Developing training modules for the National STEM Learning Centre and conducting research on Inquiry-Based Science Education

² The ASEAN Science Leadership Programme was inaugurated in 2016 and is an initiative of the Thai National Science and Technology Development Agency in partnership with the GYA, inspired by the successful Africa Science Leadership Programme. Co-developed by the University of Pretoria and the GYA, it builds on the Global State of Young Scientists (GloSYS) project by addressing central issues that emerged from this research. The programme aims to grow mid-career academics in the areas of thought leadership, team development, engagement and collaboration, with the intention of enabling them to solve the complex issues that face young scientists and the global community. Access more at: <https://globalyoungacademy.net/activities/african-science-leadership-programme/>

- (IBSE), which introduces new, active learning and experiential-based learning pedagogies to promote science engagement in schools.
- o Organising regular monthly Science Cafés that bring scientists into direct contact with the public.
 - o Conducting science demonstrations and outreach programmes reaching more than 20 000 members of the public annually.
 - Science integrity: YSN-ASM conducts a Responsible Conduct of Research (RCR) programme aimed at ensuring that RCR is integrated into the science curriculum at universities and creating a responsible and ethical scientific ecosystem in the country.

YSN-ASM faces many challenges and some of these relate to:

- Limited publicity and lack of a promotional strategy.
- Improving collaboration with other local stakeholders to reduce redundancy and increase synergy across shared missions.
- Increasing diversity of expertise and institutions, particularly in ensuring a balanced dialogue between natural/physical sciences and the social sciences, arts and humanities.
- Time and commitment of young scientists.

Lessons learnt relate to:

- Establishing a strong relationship with the senior academy, particularly in the initial stages of the young academy's establishment as this provides credibility as well as opportunities for involvement in high-level nationwide initiatives. Independence is often achieved after credibility is demonstrated through co-organised activities.
- Creating an ethos where young scientists are not competing but complementing the initiatives of the senior scientists.
- Developing niche areas that are neglected or underdeveloped.
- Ensuring that the programmes can benefit the maximum number of people.
- Demonstrating strong levels of proactivity and volunteerism.
- Nurturing strong communication channels and leveraging social media platforms.
- Ensuring that achievements by individual members are recognised and celebrated, and their professional development supported.

Science for Policy, Policy for Science? Considerations of a Scientist-Politician (Prof Dr Annelien Bredenoord, the Young Academy of the Netherlands)

De Jonge Akademie is based in Amsterdam and has 50 members elected for five years. Academy membership is prestigious in the Netherlands and

the majority of members are very active. In addition to being a Professor of Ethics of Biomedical Innovation at the University of Utrecht and a member of the Young Academy of the Netherlands, Prof Bredenoord is also a politician and a member of the Dutch Senate, holding the health care, privacy and big data portfolio. One of the main advantages of being a senator is that it provides opportunities for regular contact with high-level politicians.

Traditionally, science and society have been perceived as two completely different realms. Science is perceived as a distant, epistemic activity that makes use of particular scientific methods to achieve its objective of 'certified knowledge'. Science is clearly separated from politics and from society. This persistent view has been called 'Mode 1 Science and Society'. One of the many reasons why Mode 1 is problematic is because it is about technological determinism. However, insights from the sociology of science have shown that science and society are much more interrelated and interactive than previously thought. The grand challenges our world faces today (including the SDGs) cannot be resolved using the traditional approach. Certain sociologists describe how scientists are wheeling and dealing, that they have ethical and political ideas that influence their research and their teaching, and that the production of scientific facts is not filtered through a funnel of puristic ideas. It is necessary to dismiss Mode 1 and move to 'Mode 2 Science and Society', which has to do with co-production and co-evolution of science, technology, ethics and society.

Mode 2 has implications for young scientists from a normative as well as sociology of science point of view. It shows that it is not the differentiation of science on the one hand and society on the other that determines successes, but the integration of the two. The importance of translating research results into workable interventions in society and approaching the SDGs from a Mode 2 perspective are evident. Many of the challenges that science and society have to solve have no clear solution and unforeseen outcomes, are socially complex, involve changing behaviour, require sustainable innovative technology and approaches, as well as interdisciplinary approaches, and are interdependent and multi-causal. In order to make progress in addressing these problems, collaboration and integration of science and society are essential. Ethics and society need to be parallel or proactive and not end-of-pipeline considerations.

An example of Mode 2 Science and Society from my academic and political work has to do with introducing big data into society in an ethically sound manner. This challenge requires data scientists, epidemiologists, normative scientists, social scientists, end-users, politicians, industry, as well as principles in order to be resolved. Progress cannot be made if the focus is on what divides scientists from policymakers.

Scientists are co-producers and co-creators of science and of society and should take up this role to show how science and scientists work and how they produce facts, and explain that scientific facts are not carved in stone but are 'provisional fixed points'. Scientists should work interdisciplinarily and be inclusive, context-driven and problem-focused. They should integrate ethics in science and technology, argue for the translation of research results into workable interventions, products or ideas in society, and be involved in public service. Mode 2 is essential to improving quality of life globally.

Discussion

Dr Connie Nshemereirwe: How do you encourage busy young scientists to do volunteer work, particularly if the young academy is not seen as prestigious?

Response, Prof Monika Kędra: Sometimes being a smaller group of volunteers works better than having a large group, although it means that each one has to do a lot of work. Those who join the academy should be willing to be active. Politics may have a bad reputation in some countries, but there are other ways that young scientists can be involved at other levels of society where there are also opportunities to promote science and scientific merit.

Prof Maribel Dionisio-Sese: How do you disseminate information about and invitations to upcoming Science Café events?

Response, Dr Shai Lay Ching: The Science Café is a monthly event. YSN-ASM partners with an organisation to run the events and actively work together. We approach restaurants, cafés or other venues that are cosy and comfortable and easily accessible, and bring customers to them. This is the drawback. Social media is used to disseminate information and invitations about the events. Brainstorming is used to come up with topics (often emerging topics) that are of interest and relevance to the public. There is two-way communication and the events are interactive. Good communication is critical and scientists must be able to communicate and explain their research in layman's terms.

Dr Robert Lagerström: In Sweden, we have been discussing how researchers can share their results with the public in a way that ensures that the results are not interpreted incorrectly. Do you have any suggestions about how to approach this issue?

Response, Prof Annelien Bredenoord: The best way is to be proactive and have a press statement ready before the research paper is published. Some

journalists will prefer to use the statement that you provide. Media training is helpful because scientists can learn how to summarise their paper. When writing a paper, think about each sentence on its own and what value it adds to the paper. Get to know the science journalists so that you can communicate directly with them about new papers coming out.

Response, Prof Monika Kędra: We have had some bad experiences with the press, but also good experience when a journalist was invited to join a group of scientists on a research expedition. He had a chance to witness research activities, discuss with scientists and learn about scientific work and the climate change. He now publishes very good scientific articles on these topics in the newspaper.

Delegate (name not captured): Very little funding reaches young academies in Africa. What do you do to ensure that politicians invest more in science?

Response, Prof Annelien Bredenoord: The Netherlands invests quite a lot in science, but a large part is going to innovation and so-called applied research. In recent years the government investing less in basic science and broader research programmes. As a politician I find it always important to vote in favour of education and research and make these one of the key messages of one's party.

Mr Joseph Mwale: Zambia is considering setting up a young academy this year and wants to make it prestigious to belong to the academy. How can this be done?

Response, Prof Annelien Bredenoord: The Young Academy of the Netherlands is prestigious because it has the support of the national academy and all the deans of universities. Academy membership improves your career prospects. Young academies must be seen to be active and relevant in order to be regarded as prestigious.

Response, Dr Shai Lay Ching: It is difficult to be elected to the young academy and the criteria are stringent. This makes it prestigious. It is important for young scientists to be viewed by young people as positive role models and icons in society, and science must be seen as a fun thing to be involved in.

Response, Prof Monika Kędra: It is very important to share the success stories of young scientists, even if you have to reach out to another young academy for such stories to share with your members. This attracts more people who want to become academy members.

Dr Merritt Turetsky: Science as a global movement is shifting away from metrics of success rated by papers and is being asked to demonstrate success in uptake of knowledge. One of the ways to get young scientists to become more active and to engage is to change the system so that volunteer activities are more recognised by universities and funding agencies. Young academies need to lobby funding agencies so that we can start to change the metrics and encourage more young scientists to give of their time to activities of the young academies.

Dr Elliott summarised the thoughts that would develop through the discussions as follows:

- The importance of leadership and strategic partnerships.
- Working in a more interdisciplinary, problem-focused, interactive and inclusive way (co-design and co-production).
- Changing the metrics and the rewards and incentive schemes for scientists to get more involved in societal work.
- Linking with national agendas and influencing national curricula.
- Fighting fake news in the anti-science movement.
- Being proactive, positive and motivated in social service.

THEME 2: THE POTENTIAL FOR YOUNG SCIENTISTS TO HARNESS TECHNOLOGY AND INNOVATION TOWARDS ACHIEVING SDGs 3, 8 AND 11 (FACILITATOR: PROF BINYAM SISAY MENDISU, PROGRAMME OFFICER FOR TEACHER EDUCATION AND CURRICULUM DEVELOPMENT, UNESCO, INTERNATIONAL INSTITUTE FOR CAPACITY BUILDING IN AFRICA, MEMBER OF GYA AND ETHIOPIAN YOUNG ACADEMY OF SCIENCE)

The Potential for Young Scientists to Harness Technology and Innovation towards SDGs 3,8 and 11 (Dr Robinson Musembi, Department of Physics, University of Nairobi and Kenya National Young Academy of Sciences (KNYAS))

Dr Musembi presented some of the success stories of young scientists, some of whom are from the University of Nairobi's Department of Physics, to demonstrate the potential for young scientists to harness technology and innovation towards achieving the SDGs, specifically SDG 3 (Good health and well-being), SDG 8 (Decent work and sanitation) and SDG 11 (Sustainable cities and communities).

- More than 30 million people around the globe have speech impairments and must rely on sign language, which poses a language barrier when seeking to communicate with non-sign language users. 'Sign-io' is a sign-language-to-speech translation glove developed to address language barriers between sign language users and the general public. The glove recognises various letters signed by sign language users and transmits this data to an Android application where it is vocalised. The project was one of the winners at the regional American Society of Mechanical Engineers (ASME) Innovation Showcase (ISHOW) competition held in Nairobi, Kenya, recently.
- 'M-KOPA Solar', which is a kit for a stand-alone solar power system consisting of panels, lamps and a device that contains a SIM card that is used to pay for electricity produced. It is designed for people who cannot afford to buy the whole kit upfront.
- 'LittleCab', which has been adopted by the biggest telecom company in Kenya, SafariCom. The App is used to call a taxi and pay for the service.
- 'Intelligent Transport System' allows for monitoring of vehicles, particularly fleet vehicles and public transport vehicles.

These inventions have attracted substantial interest from business and the public.

Forward Thinking Humanitarian Response in Urban Contexts: Integrating Refugee and Host Communities – A Case Study of the Local Advisory Kalobeyei New Settlement Spatial Planning in Turkana County, Kenya (Ms Ang Jia Cong, UN-Habitat, Urban Planning and Design Branch, Kenya)

UN-Habitat works closely with policymakers, governing bodies and researchers to produce science-based evidence when planning projects that serve to address crises and resilience, as well as sustainable development in projects worldwide. The presentation, using a case study from the Kalobeyei Settlement in Kenya, provides a holistic view on how the different SDGs and science can be merged in a way to provide for the greater common good.

By 2050, Kenya's population will have increased five times. For cities and settlements, the increasing world population means that the amount of resources and infrastructure will have to increase dramatically. While cities and towns develop sprawling townships and slums, UN-Habitat advocates for greater compactness, integration and connectivity as a whole and uses a three-pronged approach to integrated planning involving urban legislation, economy and finance, and planning and design.

The Turkana county government has thought about how to cater for the increasing rise in the population and over-populated refugee camps in the county. In 2015, 1 500 hectares of land was allocated to the Kalobeyei New Settlement to host 60 000 refugees from South Sudan. In 2016, the United Nations High Commissioner for Refugees (UNHCR) and UN-Habitat decided to help with the planning process, which began with a socio-economic survey covering the host communities, as well as the refugees from a variety of countries. The biggest issue in terms of a humanitarian response and resettlement relates to the tension and conflict between host communities and refugees. This is addressed through working with social researchers to incorporate the refugees harmoniously. A strong People's Participatory Process was used taking into consideration economic, social and environmental conditions, working with refugee and local community organisations and members of disadvantaged groups throughout the planning process.

The Kalobeyei New Settlement is designed with the intention to link with the Kenya Vision 2030 and has great economic potential due to its geographic location. The settlement is not seen as a temporary site but a long-term sustainable development pilot settlement project designed specifically keeping county policies and SDGs in mind and taking a harmonious approach to the legal and institutional framework for planning.

The situational analysis, with substantial input from a group of researchers working on the project, took into account the regional and district context, sectoral considerations, such as climate, access to services, livelihoods and housing and energy, water and sanitation, and site constraints. The integrated planning proposal for the settlement applies the five main principles used by UN-Habitat:

- 1 Ensuring adequate space for efficient street network.
- 2 Promoting mixed land use.
- 3 Encouraging a mixture of social groups.
- 4 Supporting capacity for densification.
- 5 Emphasising walkability and interconnectivity.

Refugee camps have not traditionally been designed sustainably but with the help of research and science-based evidence it is possible to plan a long-term settlement. A greater understanding of the site allows for spatial development concepts to be incorporated in the planning, including ecology, soil quality, providing for a walkable grid, retaining the green areas for agriculture and placing the economic centres on key access points to stimulate economic development.

The success of implementing the plan will largely depend on the level of commitment by each key stakeholder, political will, reliable water supply, policy and legal support, financing and institutional capacity.

Genomics Making Drug Treatments Better – A Focus on Human Immunodeficiency Virus/Tuberculosis (HIV/TB) Therapy (Prof Collet Dandara, The World Academy of Sciences-The Young Affiliates Network (TWAS-TYAN), South Africa)

TWAS is a global science academy based in Trieste, Italy and established in 1985 for the advancement of science in developing countries. It works to support sustainable prosperity through research, education, policy and diplomacy. Election of TWAS fellows is based primarily on scientific excellence. Each year, the five TWAS regional offices select up to 25 scientists younger than 40 as young affiliates for a five-year term. TYAN was formed as a means for the young affiliate alumni to continue working together and its executive committee has representation from the five regions. TYAN aims to catalyse interdisciplinary collaborations to address global challenges (including the SDGs), supporting the closure of the science gap between the developed and developing countries through activities relating to growing the network, building capacity, increasing visibility, enhancing collaboration and addressing SDG challenges.

TYAN aims to connect with other organisations, to promote its visibility and to connect more young scientists by participating in conferences and meetings in different countries. The 1st TYAN International Conference will take place in Rio de Janeiro in August 2017 and has as its main objectives:

- to further increase interactions among young affiliates;
- to provide a platform to explore cross-border scientific collaborations (particularly by linking scientists from less-developed countries (LDCs) with those from developed countries);
- to address regional issues related to SDGs (ensuring that each TYAN member's work dovetails with the SDGs).

Prof Dandara's work relates to SDG 3 and is focused on pharmacogenomics, looking at the genomic diversity of world populations, specifically genomic diversity among African populations, which exhibit greater genetic diversity than other populations. Drugs manufactured under the backbone of a Caucasian or Asian population might work well with those populations but have adverse effects in African populations. The genomes of African populations are being studied in order to facilitate personalised drug treatment in particular relating to antiretroviral therapy in African populations.

where adverse drug events are a major problem. Pharmacogenomics involves the use of our understanding of genomics to make drug treatments better and safer, moving us closer to precision medicine.

Prof Dandara and a group of postgraduate students are also involved in a mentorship programme with high-school learners in a local township in Cape Town (Gugulethu) teaching mathematics, physics and accounting on weekends. Learners have shown increased motivation to study and to learn more about science.

Discussion

Mr Stanley Maphosa: What is the role of TYAN in relation to young academies in the regions?

Response, Prof Dandara: TYAN is interested in science cooperation. The network is for people who have completed their term as TWAS young affiliates. We hope to form centres of connectivity through expertise (that will be on our website) so that people can identify places where they can go to that are relevant to their work. We serve as a bridge between the young and the senior scientists. TYAN raises funds for its activities but TWAS also has funds available for postdoctoral fellowships, travel and other needs. It would be helpful to harness these funds so that young scientists can travel between regions to acquire skills.

Dr Robert Lagerström: The presentations were about the SDGs 3, 8 and 11, but how can the NYAs aid in these SDGs and in the work that was presented? How does the role of the NYAs fit in with the work of the presenters?

Response, Ms Ang Jia Cong: In many ways, scientists and researchers of all ages contribute to humanitarian projects and crises-solving solutions. UN-Habitat acts as a platform to approach policymakers, researchers and scientists – to bring them together to work and find solutions that move development projects ahead. It is also worth mentioning that a lot of self-led research also contributes to our projects. For example, we have monthly urban research articles providing information that contributes to many other international projects in various ways. My presentation at this conference is to raise awareness of the many possibilities and directions that scientists can choose to approach areas of interest or global topics, presenting avenues for debate that bring insight and address these many issues, especially the SDGs.

Response, Dr Robinson Musembi: The contribution of the NYAs to these young innovators is through popularising their discoveries. Some of the innovations do not come from university students or even educated people, but are products of KNYAS' outreach programmes to the public.

Prof Mendisu concluded the session by highlighting the importance of the role young scientists have to play in addressing the SDGs, in particular SDGs 3, 8 and 11, and the opportunity and potential they have to contribute to the SDGs. He advised young scientists to align their research with the SDGs.

SESSION 3 ● ● ●

BREAKOUT SESSIONS (FACILITATOR: PROF MORITZ RIEDE, GYA CO-CHAIR)

Delegates were divided into three groups that discussed two different themes, namely:

Theme 1: Young Academies: Activities, Opportunities, Barriers, and their Future Impact.

Theme 2: Innovative Methods to Increase Collaboration and Networking between NYAs.

Report Back to Plenary

Group 1 (Dr Merritt Turetsky, College of New Scholars, Scientists and Artists, Canada)

Activities: It appeared from the presentations that the activities were common across NYAs and this was reinforced by some of the academies that did not present. Common activities included outreach to educational groups and to teachers and creating science competitions to help stimulate conversation and enthusiasm about science. The group felt that some discussion about best practices among academies would be helpful, especially for those academies that are beginning to mobilise. There were some contentious issues raised about being ambassadors for and aligning with the NYAs. Having some consensus about how to be ambassadors for young academies was important. Members should be ambassadors for other young scientists and use the academies, through their activities, to create a platform for other young scholars and scientists, particularly marginalised voices, to be heard.

Opportunities: A wide variety of mentoring programmes and infrastructure are already in place offering opportunities for young academies to be

involved in mentoring, and to grow and learn from each other. Some countries were creating mentorship programmes between scientists and refugees. The group also identified entrepreneurship as an opportunity within young academies, by twinning young entrepreneurs with established business partners and assisting the young entrepreneurs to develop their ideas and achieve their goals.

Future impact: One of the group's goals for the future of the NYAs was increased visibility and measurable impact, through coordinated events done simultaneously, such as science weeks, where all the NYAs have a similar goal, programme and materials, and broadcast these within their countries.

Collaboration and networking between NYAs:

- The unharnessed collaborative capacity of the NYAs in some regions needs to be tapped into.
- Establishing a mentorship programme (a 'sisterhood') where the academies that are more established share lessons learnt and experiences with the more recently established academies. This could be done at a regional level and based on common development goals.
- A system of sharing best practices is valuable for every young academy. This was an important point of the group's discussion.
- Preparing common policy statements as a group of young academies about shared best practices with regard to issues such as how academy members can act as ambassadors and how they can link with the young academies in outreach with journalists and publications.

Group 2 (Mr Andris Freimanis, Association of Latvian Young Scientists)

Young academies harness expertise and serve as the voice of young scientists. Young people should help shape the future because they will live to see that future.

Opportunities: Young academies provide important opportunities, such as increasing the capacity of their members and contributing to the development of members' leadership skills. Young academies should:

- Make more and effective use of social media.
- Take up the idea of Science Cafés.
- Meet informally with politicians to discuss science.
- Bring science to the forefront of politics and election campaigns.
- Focus on helping resolve local problems through committee structures.
- Influence policy by providing opinion pieces and newspaper articles.

- Use contributions to global forums to bring prestige to scientists and the NYAs.

Barriers: Some of the barriers faced by young academies are:

- The lack of autonomy and independent funding.
- Senior scientists inhibiting change.
- The lack of motivation of some young scientists to become involved in the young academy.

Collaboration and networking between NYAs:

- Use global forums to network and collaborate with other young academies.
- Collaboration and networking enhances cross-cultural communication, provides potential access to funding and expertise from other countries, and is a way for young academies to assess themselves, to exchange ideas, and share success stories and lessons learnt.
- Universities could be used as venues for collaboration between NYAs.
- Joint statements put out with the GYA would promote collaboration.

Group 3 (Dr Karen Cloete, SAYAS)

Activities: Many of the activities of the various NYAs are overlapping. Young academies that did not give presentations in the meeting indicated that they are involved in the following activities:

- Connecting with marginalised indigenous communities.
- Collaborations with artists, business people, and politicians.
- Engaging with postgraduate students.
- Organising a symposium of Big Science covering multidisciplinary themes.
- Organising multidisciplinary national conferences.
- Offering grants, awards and training for career development of young scientists.
- Leadership and writing courses offered to young scientists.
- Training in English proficiency and in a variety of disciplines offered to young scientists.

Opportunities: Young academies have opportunities to:

- Represent young researchers.
- Provide a platform for wider demographic representation.
- Foster collaboration.
- Interact on a global level.
- Engage with policymakers.

- Demystify science among the public.
- Increase public trust in science.
- Create linkages between young and senior academies and build mutual respect.
- Create a database of opportunities available in various institutions and countries that is accessible to young scientists from other institutions and countries.

Barriers to young academies are:

- Funding.
- Language resource limitations.
- The lack of (or unreliable) basic infrastructure.
- The lack of exposure to science from an early age.
- Pressure to perform.
- Unbalanced lifestyle of young scientists.

Collaboration and networking between NYAs would be enhanced through conferences, workshops, joint proposals, interactions and exchanges.

Discussion

Dr Monir Uddin Ahmed: The NYAs are both positively and negatively influenced by their senior academies. We should request, possibly through IAP, that there should be engagement with senior academies' organisation and structure that would modernise and increase efficiency, and the democratisation of the senior academies.

Ms Phatsimo Matshediso: What kind of support should new young academies expect from the more established academies?

Dr Connie Nshemereirwe: Liked the idea of sister (or brother) academies because there was no need for the new academies to reinvent the wheel when the more established academies have identified best practices and have experience.

Dr De Ming Chau: Each young academy should have an updated database of expertise available within their membership. This would facilitate collaborative research projects.

Delegate (name not captured): Suggested that new young academies should ensure that they have strong administrative support, as this would free up the scientists to do what they do best.

Dr Tracey Elliott: (1) There is a clear tension between what policymakers are telling the science community to do (speed up, simplify, compromise and account for trade-offs) and the conventional way that science is delivered. Could the NYAs play more of a role in challenging conventional methodologies (such as peer review, evaluation and review of career development)? (2) Two common criticisms of the way that science endeavours feed into policy are:

- Science is still working in disciplinary silos. The NYAs often follow the role of the senior academy by being organised according to conventional disciplines. Is there something that young academies can do around cross, trans or multidisciplinary?
- The importance of inclusion over open policymaking. More voices are needed to help frame and co-design policy questions and evidence-based solutions.

What are your thoughts about these challenges?

Response, Dr Karen Cloete: Our group discussed the importance of building a long term and trusting relationship with policymakers in order to understand the areas that require policy interventions and how to align research with policy questions. Scientists must also be able to clearly articulate their research to policymakers in order to ensure an understanding of the impact of the research on policy and the risks involved.

Response, Dr Merritt Turetsky: Co-production must be brought to the forefront. We have translated science for policymakers and we need to do better than that. Bringing Parliamentarians into our spaces is a good idea. We need to strengthen the equal path to knowledge transfer. NYAs should do whatever they can to facilitate co-production.

Prof Riede wrapped up the discussions as follows:

- The NYAs are involved in a variety of activities.
- There are common themes (such as outreach, capacity building, and networking) that run through the presentations and the discussions.
- The NYAs can achieve more and have a bigger impact by working together and collaborating on common themes.
- The idea of 'sister programmes' involving internal support and resources, and sharing best practices between new and well-established young academies should be pursued.

SESSION 4 ●●●●●

THEME: GENDER (EQUALITY AND) EQUITY IN NYAS (FACILITATORS: (1) MS DOROTHEE NGILA, ORGANISATION FOR WOMEN IN SCIENCE FOR THE DEVELOPING WORLD – SOUTH AFRICAN NATIONAL CHAPTER (OWSD-SANC) EXCO AND NRF (2) DR PALESA SEKHEJANE, OWSD-SANC MEMBER AND HUMAN SCIENCES RESEARCH COUNCIL (HSRC))

Key areas to be taken into consideration by NYAs as well as questions and resources relevant to gender equality and equity are:

- Participation: Who is included in NYAs membership? What value would diversity and inclusion add to the functioning of the NYAs? Who sets the strategic tone in NYAs' agendas and who else should be part? What role can the NYAs play in advocating for the increased participation of women and girls in the science system of your country and in leadership and for gender diversity and inclusion in the national system of innovation (NSI) of your country? OWSD and African Women in Agricultural Research and Development (AWARD) have helpful resources on the kinds of discussions and actions that can be taken in this regard.
- Policy: Who serves in the NYAs research groups, panels and committees that result in policy recommendations to government? Is it diverse and inclusive, and if exclusive, what does this mean about the recommendations made to government? Is the discussion on gender mainstreamed in the NYAs topics and themes? What role do young scientists play in encouraging, promoting and supporting policymakers to have gender as part of policy-making? Gender in Science, Innovation, Technology and Engineering (GenderInSITE) has a helpful repository of resources that can help to spark the conversations and actions required to address these questions.
- Research: How do NYAs encourage researchers who make up their membership to look at gender as part of their research and innovation leading to solutions that serve the needs, abilities and concerns of both women and men? The GenderInSITE website has numerous resources that indicate the kinds of questions that should be asked that take gender and sex as variables into consideration in research. GenPORT is an internet portal for sharing knowledge and inspiring collaborative action on gender and science.
- Research and intersectionality: Who are you addressing and whose problems are you solving in your research?

Some questions to ponder in the discussions are:

- Is there inclusion and diversity within respective NYAs?
- How should NYAs address any imbalances?
- How is gender considered in respective NYAs programmes?
- What role can NYAs play in advocating for gender equality and equity within their NSI?
- How best do young scientists collectively decentralise and disseminate the education about gender equality and equity into early education for impact?
- How do we best retain the best minds in science along the STEM pipeline?

Delegates were invited to reflect on their own NYAs processes, structures, systems in relation to gender equity and equality.

Discussion

Dr Connie Nshemereirwe: In general, people define gender as male and female and it is very difficult to move beyond this to see (and recognise) the full spectrum of gender. This is a very important topic but would it not be more productive to concentrate on the bigger issue, which is diversity, rather than gender?

Dr Gergely Toldi: At a recent forum in Hungary, there was a discussion about how an NYA could be established in that country and questions about gender and the position of women in science and the senior academy were raised. In Hungary, only 5% of the membership of the senior academy is female. It was felt that women, as well as young scientists were neglected. In Hungary there is definitely a huge gap between men and women in science and the gap widens as scientists progress in their careers. This is typical globally and perhaps not only in science but also in the corporate world. The reasons for this are not necessarily evident.

Prof Helena Filipsson: This is very important. We ought to recognise that it is not about how we see each other but about how I perceive myself and what gender I perceive myself as. We should avoid gender stereotyping and categorising people including our students and fellow scientists. This is complex and it is the way the world looks like. We have to take this into account.

Ms Dorothy Ngila: The question is how would society (in South Africa for example) look like today (structurally and otherwise) if we had not focused on

race as an issue post-1994³? Do we approach the problem from an umbrella, humanistic perspective or do we ask questions about the way society treats different genders differently and the way we are constructed differently in terms of our gender roles and responsibilities. Can we continue to say we are all humans and equal when we have such differing experiences as a result of how society views us?

Dr Binyam Sisay Mendisu: Do the NYAs have enough diversity especially in terms of gender? In Ethiopia the young academy has 29 members but only three are female. We had a discussion about this but there was resistance through the rigid criteria that came from both men and women. We have not managed to convince particularly men that this is an important issue. This raises a question about the way gender equality is framed. It needs to be framed in a way that makes it clear that we will all lose when there is no equity. We cannot be passive in this regard.

Ms Dorothy Ngila: The narrative that there are not enough women researchers who can be members of our academies is incorrect. It is important to continue with horizon scanning for women researchers who do exist in the system, to think about these issues and be innovative about how to engage more people in the academies.

Dr Merritt Turetsky: My entire career has been immersed in the discussion about gender in science. The men-versus-women paradigm arose when I was an undergraduate student and was an easy paradigm to adopt because the easiest explanation is that of child-bearing and the problem will be resolved by providing support to women to get back into work after having children. The data show that throwing a lot of money at mothers returning to science does not fix the problem. The problem is much more nuanced and complicated. NYAs can help mentor women by training them how to speak confidently and being confident in their skills in different kinds of gender and diversity roles, and helping them see their potential. Exclusion of women means lost capacity. In Canada, the young academy membership is gender-balanced, but this is not enough. We have to make sure that our academy is promoting young female scientists to leadership positions.

Dr Palesa Sekhejane: We are scared to talk about equity or inequity and revert to equality. We use numbers and talk about the balance instead of addressing the in-depth gender equity issues. It is not a matter of men versus

3 Following years of liberation struggle against apartheid rule, the first democratic election was held in South Africa in 1994.

women. Inequity arises when people have equal opportunities but different circumstances. We need to identify the circumstances that lead to inequity. In my work environment, I am the only female among nine males with a PhD and I am not a gender specialist, but all gender work is relegated to me. None of the men is doing any gender equity or equality studies. I am curious to understand why men want women in the sciences.

Dr Victorien Doughton: This issue will remain a topic of discussion unless we change behaviour. I have a team of ten collaborators in my laboratory and eight of them are women. In my experience, women work better than men and are more conscientious. The main problem is that women in some African countries are not well supported and cannot therefore apply for OWSD fellowships for PhD studies. After a full day's work, women are still expected to attend to chores and responsibilities at home.

Ms Dorothy Ngila: It is very important to remember that gender is not synonymous to women. Gender is synonymous to the situation mentioned by Dr Doughton. Women and the fact that they bear children are not the problem. This discussion must bear this in mind. The problem is whether the science system (and society) is supporting holistic growth of families and parents in science.

Prof Monika Kędra: What should we do to bring more women into science? This implies that we should be thinking about how to encourage men to share more of the work at home to ensure that the burden is equal.

Dr Robert Lagerström: There is a lot of research on this topic. Diverse research environments are more efficient, of higher quality and provide more innovative solutions. Having people from diverse backgrounds and experiences fosters discussion. It should be clear that we need to look at the research on this topic and work from there.

Delegate (name not captured): The community is aware of the importance of gender equity and equality. The problem is systemic and must be addressed as such in order to facilitate cohabitation of family and science. Men have to be part of the gender discussion.

Delegate (name not captured): 'The major issue is in our midst'. Academics and researchers need to ask themselves what they do to encourage the diverse group of students that they supervise and how they accommodate diversity. Let us look at the criteria for academy membership and for funding. There are not many women who have seven consecutive years of experience.

This means that there will not be enough women in the academy. There is a huge generational gap. No diversity within committees will mean that agendas and outcomes may be skewed.

Prof Collet Dandara: We tend to classify people according to what we perceive their gender to be, but gender is a private matter and not always evident from the outside. Another discourse should address policies that accommodate those whose gender cannot be classified in the traditional way, and the expectations of those they interact with, for example in the health sciences.

Dr Anna Coussens: There has been a lot of discussion about mentorship programmes. How do we think about how we team up students and supervisors, and mentors and mentees? We need to think about giving the opportunities to the right people with the people that they need with the experience that they need to learn from.

Dr Chai Lay Ching: The gender ratio is balanced in the Malaysian academies. There are more women than men academics and the number of women in engineering is growing. Gender equality and equity is quite high in Malaysia and many support networks are provided for female academics. Gender is not a consideration in the election of academy members. Men and women think differently and complement each other.

Ms Munashe Kurehwatira: NYAs should deliberately mainstream gender issues into all their activities and policies.

Dr Marion Schulte zu Berge: There is not a once-off solution. It is something that has to be fought every day and is a constant struggle. Gender equity and equality must be made explicit. Academy members have to keep up the topic.

Prof Helena Filipsson: It is important not to just count heads. There is a potential risk that a female professor will end up in a lot of committees and become a gender 'hostage' instead of promoting her science. There will have to be some form of compromise as well as compensation where the focus is on achieving gender balance.

Prof Udi Sommer: It is also important to think about the discourse. In general, men's discourse about gender equity makes them guilty until proven otherwise. Men can add to this conversation just as much as women but in many cases they do not. In the context of the NYAs, men can have the privilege of being innocent until proven otherwise. This might enhance the discourse as well as the outcomes.

Delegate (name not captured): We need to take a step back and look at what women have achieved in relation to the scientific landscape, then build on it and identify the gaps. Gender equality has come a long way and has achieved a lot but this tends to be overlooked and focus on what is not being done. There is also gender discrimination against men.

Ms Dorothy Ngila: The role of the NYAs is to provide the platform to be able to have these conversations in an open way.

Dr Binyam Sisay Mendisu: Any kind of discrimination has a history and at some point it becomes a culture and then it is institutionalised. When dealing with it, there is a backlog of events that we have to account for. Sometimes it is about the numbers as well and quotas are necessary. We need to be bold without compromising the criteria, and headhunt, mentor or do whatever it takes to bring the issue a little bit closer. The GYA should take a position on the issue in order to make known the values and the position of the GYA.

Dr Connie Nshemereirwe: There is a need for members of all genders to understand one another and be more open to one another, but also to recognise the history we have. I have emancipated myself as a female by becoming aware of my humanity and appreciating that everyone else is a human being. When I approach a situation where I participate, I think of myself as having an equal right as a human being. Many of us need to be more open to understanding ourselves. We as women do not appreciate our own humanity and our own right as such because of history. It is about educating about ourselves and the other.

Ms Dorothy Ngila: There are certain areas where NYAs can play a key role. It is clear that there are individual questions that are being posed to us and that there are institutional system-wide issues as well. I encourage everyone to think through what this issue of inclusivity and diversity means for your academy and for you as a member of an academy, the bigger context that you exist in, and the role you can play in that regard. The success stories need to be shared. There are approaches and strategies that some academies have implemented that could form a base for future work in others. There are key challenges and opportunities for NYAs to open platforms for discussions and come up with innovative approaches to deal with these issues.

Dr Palesa Sekhejane: This has been a very informative session. We should continue to think about many of the issues raised in these discussions.

SESSION 5 ●●●●●

POSTER PRESENTATIONS

The following presented posters:

- Mr Andris Freimanis, Association of Latvian Young Scientists. Title: Latvian Experience in Bridging the Gaps between Science and Policy, Industry, Society
- Dr Tran Huy, Vietnam Young Academy. Title: The role of Vietnamese Young Scholars for the One Health Approach in Vietnam
- Ms Chanel Rampartap, OLSPS Marine, Sustainable Oceans Alliance and UN Major Group for Children and Youth (UN MGCY). Title: A Discussion at the Interface of Built & Natural Environments: Coastal Cities & Impact of Resource Consumption on Urban Health
- Dr Merritt Turetsky, College of New Scholars, Scientists and Artists, Canada. Title: Emerging Research to meet Canada's Challenges in Food and Water Security under Urbanisation and Rapid Climate Change
- Mr Shaikh Rafique, National Academy of Young Scientists, Pakistan. Title: Major Challenges of Clinical Waste Management in Pakistan
- Dr Vidushi Neergheen-Bhujun, Initiating Young Academy – Mauritius. Title: Evidence-based Approaches for Integrating African Indigenous Food for the Promotion of Well-being
- Dr Connie Nshemereirwe, Uganda National Young Academy. Title: Equipping Young African Scientists case study: Africa Science Leadership Programme
- Dr Ayman Elsayed, Egyptian Young Academy of Sciences. Title: Shape memory Alloys for Medical Applications
- Dr Chau de Ming, Young Scientists Network, Academy of Sciences, Malaysia. Title: Building Trust and Relevance in Science through the Promotion of Responsible Conduct of Research in Malaysia
- Mr David Niyikuri, Burundi Council of Young Scientists. Title: Human Migration and HIV-1 Transmission in East Africa Community
- Dr Patrick Arthur, Ghana Young Academy. Title: New Antimycobacterial Compounds from Wood-decaying Fungi in Ghana



Group photo of representatives from the Young Academies and similar young scientist initiatives



Drumming session



Dr Moritz Riede



Dr Beate Wagner



Dr Karen Cloete



Prof Robin Crewe



Dr Samuel Sojinu



Mr Farid Seyfullayev



Dr Marion
Schulte zu Berge



Interactive learning during the group work session



Warm fire for the drumming session



Delegates registering



Science outreach & engagement with young learners



Prof Helena Filipsson

Mr Shaikh Saqib
Rafique

Dr Sahal Yacoob

Dr Monir Uddin
AhmedMs Anna-Maria
GramattéMr Donovan
Guttieres

Dr Anna Coussens

SESSION 6 ● ● ● ● ●

MEETING DINNER (HOST: DR SAHAL YACOOB, SAYAS CO-CHAIR)

Welcome (Dr Sahal Yacoob, SAYAS Co-Chair and Prof Moritz Riede, GYA Co-Chair)

Dr Yacoob welcomed the delegates to the dinner. He acknowledged the contributions of each of the entities that made this event possible, as well as the co-organisers: SAYAS and the GYA.

Prof Riede introduced the two speakers and thanked the organisers and sponsors for making the dinner possible.

UN Major Group for Children and Youth (UN MGCY) Presentation (Mr Donovan Guttieres, Focal Point Youth Science-Policy Interface, UN MGCY)

Mr Guttieres and his UN MGCY colleagues (Ms Jia Cong Ang, Mr Odwa Ntsika Mtembu, Ms Chanel Rampartab, Ms Awodwa Magingi, and Mr Moolisa Tlali) were invited to join the meeting to talk about how best practices can be shared and to learn from the NYAs since the UN MGCY's science policy platform is organising engagements for young scientists and there is potential for synergies and working together. The UN Major Group for Children and Youth is the United Nations General Assembly mandated, official, formal and self-organised space for children and youth to contribute to and engage in certain intergovernmental and allied policy processes at the United Nations. The Science Policy Interface Platform was initiated to specifically engage youth-led communities of scientists, engineers, and practitioners in the science-policy component of over 16 intergovernmental frameworks related to sustainable development (e.g. SDGs).

The UN High Level Political Forum (HLPF) is an annual meeting that takes place over ten days and is the formal platform within the UN that is responsible for the follow-up and review of the 2030 Agenda that includes the SDGs, as well as other inter-governmental frameworks on sustainable development. Sessions on STI and science-policy interface are topics of relevance, but not many young scientists attended the 2017 HLPF and the narrative of science policy during the discussion did not match the level of importance it deserves. The science policy interface is crucial to identifying interlinkages between the SDGs, informing implementation and review at national level, and

appropriately using STIs as enablers for overcoming barriers to development. Ensuring a conducive institutional, regulatory, and policy environment is crucial to make STIs effective tools towards the SDGs. At the HLPF, there was a lot of talk about private sector-funded science groups and technology for the sake of technology (while the people and the planet were seen as external and incidental), and not much discussion on issues of access, equity, and justice.

The question posed was the following: how can young scientists shape the narrative of science policy at the global level and how NYAs, and young scientists more broadly, can contribute to the SDGs and the 2030 Agenda? It is often heard in the UN system (or other institutions) that young people are important and that they are the drivers of the future and of sustainable development. While this is encouraging, it also highlights a caution about tokenism and raises the question that if young people are the drivers of sustainable development, why are they not in the driver's seat?

The UN MGCY was established in 1992 at the time of the UN Conference on Environment and Development when the importance of hearing the views of civil society from different sectors on sustainable development was recognised. The resulting document, Agenda 21, established a mechanism called Major Groups and Other Stakeholders, which gave critical segments of society a protected space and seat in the UN system to be able to contribute to the dialogue. In 2012, the space for these major groups was enhanced to include other constituencies and be more inclusive. In order to have an impact on the policy, especially from the scientific perspective, stakeholders must know which avenues they can use to contribute to the negotiations.

Recognition for science policy (the importance of having evidence-based and evidence-informed science policy, design, implementation, follow up and review) dates back to around 20 years ago. The annual HLPF meetings only have one three-hour session on science policy. Few of the reviews of the SDGs so far have any scientific analysis or assessments. The challenge is that if the profile of science policy is to be enhanced in the UN system and at the global level, young scientists will have to be more systematic in pushing for that and challenging the current institutions to take it up.

Agenda 21 has four areas as defined by science policy:

- 1 Strengthening the scientific basis of sustainable development policy.
- 2 Enhancing scientific understanding (recognising trade-offs, inter-linkages and systemic and emerging issues).

- 3 Improving long-term assessment.
- 4 Building scientific capacity and capability.

The 2030 Agenda includes the 17 SDGs as well as specific guidelines for implementing the SDGs at national level and expectations from member states and the Major Groups. One of the main avenues created within the 2030 Agenda is the Technology Facilitation Mechanism (TFM), which has three components:

- Annual forum on SDGs, a space where scientists, policymakers and regulators can share knowledge and consider solutions to overcome the obstacles to implementing the SDGs.
- Inter-Agency Task Team on STI, comprising 34 UN entities and their science and technology focal points. (There are no avenues for civil society inputs into this task team.)
- Online platform for sharing resources and best practices (but does not yet exist).

There is also a ten-member group comprising academia, private sector and civil society. The two-year mandate for this group is ending at the end of 2017, presenting an opportunity for representation for GYA inclusion in the group in order to have a direct link into organising the Annual STI Forum.

Implementation also takes place through the UN regional commissions, which are one of the avenues where the NYAs from the respective regions can give inputs and contribute to assessments on the 2030 Agenda. Voluntary National Reviews (VNR) is a mechanism by which countries report on the progress with the SDGs, identify the challenges, the successes and best practices. One concrete avenue that NYAs could pursue is making sure that they push for institutional spaces within the VNR mechanisms in order to have input and a voice into implementation, assessing progress and writing reviews.

One of the UN MGCY's collaborative initiatives within the UN system is to develop a Toolkit for governments on how to involve young people in their VNRs. Other avenues through which NYAs and young scientists can contribute to and shape the narrative of science policy include:

- Commission for Science and Technology for Development hosted by the UN Conference and Trade Agency.
- Annual Data Forum.
- Science policy mechanisms of each agency.

The Global Sustainable Development Report (GSDR) is only one of two mandated reports out of the 2030 Agenda. It is an assessment of assessments of existing knowledge, challenges, actions and progress and is done through

a crowd-sourced mechanism. Anyone is invited to submit policy briefs (multi-lingual inputs are accepted), multiple stakeholders are engaged and there is horizon scanning for emerging issues. The next report will be in 2019, providing sufficient time for the NYAs to give inputs. UN MGCY together with the International Council for Science (ICSU) and other groups are trying to open up further avenues for young scientists to give direct inputs.

In terms of the Science Policy Platform, the UN MGCY understands and defines meaningful youth engagement in science policy through some of the areas of work it is involved in. These are:

- Calling for more age balance, rights-based participation in the science policy architecture of the UN.
- Capacity building of youth to engage effectively in science and technology.
- Generating knowledge and assessing knowledge.
- Youth action.
- Creating a community, partnerships and networks.

The UN MGCY is thankful for the continued collaboration with GYA and seeks to further discussion on potential avenues for working together. They also would like to thank SAYAS and the co-organisers of this wonderful event.

Launch of Global State of Young Scientists (GloSYS) Africa Survey (Dr Anna Coussens, GYA ExCo Member)

The goals of the GYA are to:

- Engage in interdisciplinary, international and intergenerational dialogue on scientific issues.
- Support young scientists in career development and independence.
- Build science capacity in the developing world.
- Promote science education and science-policy integration.

GloSYS is one of the flagship projects of the GYA with the idea of creating evidence to demonstrate the challenges and motivations that shape the career trajectories of early-career researchers around the world. The results of the study are used to create policy recommendations aimed at improving the working conditions, support systems, and career prospects of young scientists. The support of young scientists in harnessing their creative element and independence, and building scientific capacity in the developing world are key drivers underlying the GloSYS project. GloSYS is embedded within the theme of the GYA activities looking at how scientists engage within the research environment, from science policy to open science, and how to support the career structures of young scientists.

GloSYS is an empirical research project using a mixed methods approach to gather quantitative and qualitative data on the research environment of young scientists. Particular themes address motivations to enter research, support mechanisms, access to mentoring, scientific productivity, challenges faced, funding, mobility, and gender inequities. In 2018, the project will culminate in the publication and dissemination of a report and policy recommendations to government agencies.

GloSYS Africa uses the term 'young scientist' to refer to anyone with a PhD or doctoral degree in any discipline, who has earned their highest degree within the last ten years, and is active in any employment sector. The project includes those with Masters degrees or equivalent, and who are actively engaged in research.

The GloSYS precursor study took place between 2013 and 2014. Altogether 650 young scientists from 12 countries in different regions across the globe were interviewed. The main findings were:

- The lack of funding is the most common obstacle for young scientists.
- Young scientists struggle to find a work-life balance, and they work long hours. (The data indicated that between genders there was no difference in work-life balance until the data were broken down for women who had children and those who did not have children.)
- Young scientists spend a large proportion of their work time on tasks other than research.
- There is a large amount of regional diversity in the obstacles that young scientists are facing.

The precursor study report, published in 2014, found that while mobility and innovation were improving, geographically-biased challenges remained. Recommendations that were made addressed improving mentorship and support structures, developing focused training programmes, improving the evaluation processes and working conditions, and rewarding commercialisation of the intellectual property (IP) of the research done. The development of the Science Leadership Programmes (SLPs), another GYA flagship project, arose as a direct outcome from this study designed to address a key need for early career scientists.

The GYA is now building on the findings from the precursor study by conducting regional studies to examine the similarities and differences in experiences across the different regions. The concept is to use similar research methods when conducting the surveys across a number of different regions so as to do comparative data analysis, as well as including some regional specific questions, based on local issues.

GloSYS ASEAN was the first regional study and the report was published early in 2017. The study looked at 404 young scientists across four countries. Major findings were:

- Young scientists do not have enough time in their workdays for research and they spend a lot of time on other tasks.
- International mobility is common.
- A greater interest in moving to the USA or Europe for career reasons than moving within the region.

The study also found that even though they are not valued well by society, young scientists are motivated to enter research by their love for science and by the benefits of research for society. Improving the way society thinks about science will lead to better interaction between society and scientists.

GloSYS Africa is now underway and will survey researchers in all countries in Africa, as well as African researchers in the diaspora. The analysis will also include a detailed follow-up with qualitative interviews with researchers in 14 countries in four regions across the continent. This large project will be conducted over three years with core funding from the German Federal Ministry of Education and Research and additional funds from the Wellcome Trust. The research team is made up of GYA researchers, non-GYA researchers, as well as six advisors and the project is divided into three phases:

- Statistical data analysis and literature review.
- Online survey.
- Semi-structured interviews.

A pilot study was conducted to help design the African regional-specific section of the study. Surveys were sent to all the NYAs in Africa and some of the issues that respondents identified were:

- Lack of adequate job opportunities.
- Limited career options beyond academia.
- Teaching workload too high/little time for research.
- Funding/politicised funding/lack of seed money.
- Insufficient income/salary.
- Lack of quality mentorship.
- Pressure to publish.
- Career knowledge.

The GYA invites anyone who is eligible to participate by completing the online survey once it is live. Delegates were asked to use their networks to help disseminate the survey and to encourage other young scientists to participate in the survey.

Information is available on <https://globalyoungacademy.net/activities/the-global-state-of-young-scientists/> and young scientists can join the project's mailing list at <https://www.facebook.com/GYA.GloSYS> and keep updated on Twitter @GYA_GloSYS.

Further GloSYS regional projects might focus on South Asia and South America.

SESSION 7 ● ● ● ● ●

REGIONAL BREAKOUTS (FACILITATOR: DR KAREN CLOETE, SAYAS CO-CHAIR)

Welcome and Recap

Dr Cloete welcomed the delegates to the second day of the meeting and recapped the previous day's proceedings.

Take-home messages from the day were that the NYAs are involved in common areas of activity, and that the NYAs should be more of a voice for young people, work together and support each other. The discussion about gender equity encouraged all the NYAs to think through the issue of inclusivity and diversity and its implication for the NYAs.

Breakout Session

Delegates were divided into three regional groups: Africa, Asia, and Europe and North America.

The focus of the group discussions was to explore regional collaboration building on previous regional meeting discussions and those from the 2nd WWMNYA in Sweden in 2015, guided by the following questions:

- 1) What concerns within your region are viewed as joint concerns that could possibly give rise to projects for collaboration? (Keep a focus on the SDGs.)
- 2) What challenges do NYAs face in seeking joint collaborative programmes?
- 3) What forums within your regions could provide avenues for engaging with policymakers in order to afford NYAs/young scientists avenues for tangible engagements in the wider science arena and offering solutions to developmental challenges?

- 4) What are the capacity lags that NYAs in your region face? Provide possible solutions or recommendations.
- 5) Provide possible programmes that NYAs in your region could collaborate on indicating how this could take shape and the benefits for the region.
- 6) How can the GYA as the voice of young scientists around the world, further assist to develop, connect, and mobilise NYAs?

Report to Plenary

Group 1: Europe and North America

- 1) Concerns in the region:
 - Academic freedom and the state of democracy in general, more particularly Poland, Hungary and the USA. The NYAs should produce a statement addressing these concerns for publication in journals.
 - Open Access.
 - Travel constraints and bans that affect attendance of international and regional conferences.
 - Strains on health care systems in Europe due to an increased demand for services and the lack of financial resources to provide new drugs that have become available to everyone in need.
- 2) Challenges in seeking joint collaborative programmes:
 - The lack of funding.
 - Champions are essential in collaborative programmes.
 - A lack of continuity in NYAs membership and long-term leadership.
- 3) Forums in regions that could provide avenues for engaging with policymakers:
 - Examples are various UN Committees, European Union (EU) Parliament and Commission, and certain NGOs.
- 4) Capacity lags:
 - Leadership, training in science policy and associated skills such as knowledge transfer, by employing a similar programme to the SLP in Africa.
 - People to take responsibility for certain NYA activities, particularly for longer-term projects.
- 5) Possible programmes in the region:
 - The NYAs and GYA should be involved in the Global Science, Technology and Innovation Forum to be held in Brussels later in 2017 and use it as a platform to build collaborations for future projects.

Group 2: Africa

- 1) Concerns in the region:
 - Health issues, non-communicable diseases (NCDs).
 - Travel and mobility constraints (stringent visa requirements with high costs as well).
 - Urbanisation.
 - Management of (natural) resources.
 - Demographic issues, particularly in the context of growing populations.
 - Language barriers.
 - Funding (African governments need to provide funds to young academies and help them source funding).
 - Waste management.
- 2) Challenges in seeking joint collaborative programmes:
 - The lack of interdisciplinarity, which is an essential part of undertaking collaborative programmes, particularly those that address environmental issues.
- 3) Forums in regions that could provide avenues for engaging with policymakers:
 - There is no organisation for Africa that brings together all African voices. It is important to have a consolidated body for all the regions of Africa.
- 4) Capacity lags:
 - Leadership.
 - Science communication.
 - Administrative support.
 - Funding.
- 5) Possible programmes in the region:
 - NYAs should put in place working groups to identify potential common areas of research and work together on projects that address these common issues.
 - Develop a database of the work already being done in the region that serves as a platform to centralise all useful information about research projects in the region, for easy access.
 - Set up good communication channels and improve the visibility of and between NYAs in the region.

- 6) GYA assistance to develop, connect and mobilise NYAs:
- The new NYAs in Africa need mentoring and administrative support from the GYA, as well as funding.

Group 3: Asia

- 1) Concerns in the region:
- Climate change and tropical diseases, influencing health and well-being, sustainable development and economic development.
- 2) Challenges in seeking joint collaborative programmes:
- Funding.
 - Skills development.
 - Coordination and leadership.
 - Political issues.

Some of the challenges could be addressed by linking the NYAs in the region through a website, and an Asian SLP.

- 3) Forums in regions that could provide avenues for engaging with policymakers:
- NYAs usually use the forums provided by the senior academies.
 - The Asian Summit.
 - Political structures.
- 4) Capacity lags:
- The lack of awareness among NYAs and senior academies about the importance of the activities of NYAs.
 - NYAs lack office space and administrative support.
- 5) Possible programmes in the region:
- Two programmes already exist in Asia, and these could be built upon.
- 6) GYA assistance to develop, connect and mobilise NYAs:
- The NYAs in Asia need funding in order to collaborate with other NYAs (the 'sisterhood' concept).
 - GYA funding to help establish new NYAs and further develop existing NYAs.

Discussion

Prof Udi Sommer: Differed with the view that all the NYAs have the same problems. In general, there is a lack of balance between the NYAs from

developed countries and those from LDCs. We all share the goal that the NYAs do not remain young forever. It is evident from this meeting that:

- There is a yearning for some sort of mentorship programme. Such a programme could be put together at GYA level and run by a committee of scientists, consisting of members from the older and the newer NYAs who are willing to lend a hand in various forms. This would serve a very important purpose.
- Mobility is critical for the purpose of science in general. Political developments and trends worldwide contribute to the imbalance between the various NYAs and the mobility of young scientists is restricted. People from developed countries are more fortunate because they have fewer constraints to travelling because their countries have bilateral/multilateral agreements in place that mean that there are visa exemptions. The GYA should create a multilateral agreement that allows for exemptions to Masters and doctoral graduates, for example.

Prof Moritz Riede: In order to ensure that the NYA representatives stay in touch with one another, a list of their names, contact details and discipline should be distributed. This could be in the form of a Google document and include social media contact details.

Prof Helena Filipsson: A simple way to initiate a mentorship programme would be to list the NYAs requiring mentorship and those offering mentorship. It does not have to be a complicated process.

Ms Anna-Maria Gramatté: From the GYA perspective also, it would be helpful to have a platform for NYAs to come together and share information about one another. The GYA has the beginnings of such a platform on its website's sub-site dedicated to the NYAs. At the moment, it is a list of links to the various NYAs' websites, where applicable. This is something that the GYA Office can take back home to look into extending the platform as discussed. The GYA maintains an email list of NYA contacts, but depends on the NYAs to help keep the list up to date. An idea that was raised in the group discussions was to have a snapshot survey of the current status of the NYAs, as well as the activities they are engaged in that may present opportunities for collaboration with other NYAs. The GYA has the capacity in place to do this work. A survey could be sent out to NYA representatives within a few weeks. Delegates would be required to encourage their respective NYAs to participate in the survey. The information would be collated and made available to all NYAs.

Dr Tracey Elliott: IAP organises itself around four regional networks. Do these have a bearing on the NYAs work?

Dr Monir Uddin Ahmed: Knows about the regional network in Asia and has attended one of their meetings on the global project on Food and Nutrition Security and Agriculture in India.

Delegate (name not captured): The NYAs collectively ought to address the mobility problem (especially within Africa) by lobbying at a high level for the institution of a scientific visa (by the AU). This issue has been addressed by many groups of scientists, but nothing has been forthcoming. We need to think of how best to take this matter forward.

Dr Karen Cloete: It was suggested that the NYAs should write an article listing all the challenges they are confronted with for publication in an academic journal, as well as a more popular journal. This would provide the NYAs with visibility and a platform for discussion and to engage with policymakers. The discussions at this meeting must continue, delegates need to stay in contact and the NYAs need to work together to make a bigger impact.

SESSION 8 ●●●

OPEN DISCUSSION AND ACTION PLANS (FACILITATORS: (1) PROF MORITZ RIEDE, GYA CO-CHAIR (2) DR TRACEY ELLIOTT, IAP)

IAP Projects on Global Policymaking (SDGs), Science Leadership and the Role of NYAs and Policy Implementation of SDGs

Recap of the IAP project on global (SDGs) policymaking and tools for the NYAs

IAP's SDG project on Improving Scientific Input to Global Policymaking is funded by the Carnegie Corporation of New York and comprises of a working group of IAP member academicians, with GYA and ICSU nominations. The three-year project is framed around the global science community's contribution to the SDGs, with a particular focus on the academies. The project broadly aims to:

- Raise awareness of the SDGs, especially in the academies.
- Explore opportunities to support SDGs more effectively, with a focus on how the academies can play their part systemically.
- Encourage collaboration and adoption of good practices among organisations that generate scientific advice and support.

The three pillars are: mobilisation, capacity building, and cooperation. Resources that NYAs can expect from the project and might like to use are:

- A slide pack of the results of the IAP survey that includes ways academies can support the SDGs (available <http://www.interacademies.org/>).
- The SDGs: A guide for merit-based academies, including mapping the UN institutional framework (available <http://www.interacademies.org/Activities/News/38798.aspx>).
- An online (searchable) database of SDG-relevant academy and inter-academy output (available <http://www.interacademies.org/>).
- Four regional meetings (over the next 12 months).
- Country and interregional case studies (insight from the NYAs on how the academy is engaging with the SDGs would be welcomed).
- Considering the role of a 21st century academy.

Recurring themes of the discussions during this meeting

Prof Riede summarised the recurring themes raised in the discussions as follows:

- Develop regional platforms of cooperation.
- Use the GYA platform to raise visibility of NYAs, to organise mentor support and help facilitate as a partner.
- Capacity lags such as leadership, communication and fundraising.
- Mentorship programme across NYAs.
- Build strategic partnerships.
- Align national agendas and international commitments.
- Engage schools and universities on SDGs.
- Knowledge transfer between generations and sectors.
- Work at the boundaries of new knowledge (horizon scanning).
- Building science literacy within the media.

Science leadership based on the challenges of supporting the SDGs (drawing on recurring themes from this meeting and participants' experience in leadership programmes)

- What does science leadership mean to you? Is every scientist prepared to take on this role? Is the system preparing scientists for this? Which of the following aspects of 'science leadership' are most important to NYAs and academicians in the context of the SDGs?
 - Research management.
 - Research excellence.
 - Science communication.

- o 'Soft' skills such as ethics, diplomacy and influencing.
- Are there examples of good practice that you think are effective in building science leadership? What makes them effective?
- To what extent does your national senior and young academy (i) exemplify and (ii) support science leadership, especially for early career researchers? What more could they be doing?
- How can senior and young academies work together on this issue?

Discussion

Science Leadership

Dr Connie Nshemereirwe: As someone who underwent science leadership training, it has become evident for me that scientists need to recognise that the mere fact that they are scientists makes them leaders.

Dr Binyam Sisay Mendisu: Scientists do have influence but to do that we have to play a leadership role and recognise that we can shape minds through what we do every day. Scientists need to recognise the important role and develop the necessary skills. It is not about power but about having influence through building relationships with policymakers and colleagues from other disciplines.

Prof Monika Kędra: It is important for a (science) leader to inspire other people to do things better.

Dr Karen Cloete: Scientists must be the voice of science and build linkages with stakeholders and mentor younger people.

Ms Munashe Kurehwatira: Soft skills are critical for science leadership. Scientists have to be able to work in teams and should be good managers.

Dr Merritt Turetsky: The young academy in Canada includes scientists as well as artists, and science is well funded. Leadership also involves standing up for our humanities colleagues who are facing opposition and cuts, and protecting academic freedom.

Dr Monir Uddin Ahmed: Science leadership is no different from non-science leadership. Improving leadership will ensure that problems get solved and lead to improved lives in every sphere.

SDGs and the role of senior and young NYA

Prof Moritz Riede: There are various players in the science advice arena. How can young and senior academies work together, especially in the context of the SDGs, through joint efforts that will make progress?

Dr Connie Nshemereirwe: It strikes me that we have received a lot of information at this meeting about things that we did not know. Young academies should reach out a lot more to their senior academies and find out what they are working on, seek mentorship and appreciate their contributions.

Dr Sahal Yacoob: In addition to actual leadership training, the senior academies should provide opportunities for young scientists to get involved in activities, be given a leadership role and take on responsibilities. This will help them grow.

Dr Anna Coussens: The senior academies should ask the young academies for their opinions and help because they have much to offer.

Dr Robinson Musembi: There could be dual membership vertical integration that allows young academy members to also be members of their respective senior academies.

Prof Helena Filipsson: For the first five years of the Swedish Young Academy's existence, it specifically wanted to establish itself as an independent organisation with its own voice separate from the senior academy. Today, six years on, the senior academy is approaching us to do joint events. We are an independent brand and keen to collaborate. Other young academies should establish their independence before trying to develop projects to do together with the senior academies.

Dr Merritt Turetsky: Partnership needs to be established and must go both ways. One of the activities that can be achieved in such a partnership is to provide a bottom-up influence on funding bodies and agencies (at a national and international level) that need to hear from the young, as well as the senior academies. We are in a shifting scientific landscape and some of the ethical issues are not yet well understood by funding agencies.

Dr Binyam Sisay Mendisu: Education is cross-cutting for most of the SDGs. The young academies should think of doing something (a meeting or workshop) on the topic of education in the framework of the SDGs, addressing the role of young scientists and getting people who are educators on board.

Prof Ndiaye Magatte: The involvement of the community in the work we are doing and the translation of research into policy are very important aspects.

Delegate (name not captured): We need to engage more with other people who are already involved in the SDGs. For example, we need to know about a nation's programme on health before embarking on a health project in that nation. Partnerships and collaboration – also with communities – are important. Young academies should be involved in discussions on SDGs and provide the academy's perspective.

Dr De Ming Chau: Issues of research ethics and responsible science should be promoted by all researchers. The Europeans have been very vocal about responsible science.

Understanding the UN framework

Dr Elliott made reference to a guide titled: *Supporting the Sustainable Development Goals: A Guide for Merit-Based Academies* which is a product of the IAP-Research project, Improving Scientific Input to Global Policymaking, which focuses on how the academies can support the SDGs. The guide was developed following a survey of IAP members, National Young Academies and GYA members undertaken between November 2016 – March 2017 in which they requested more clarity on how UN processes and structures support the SDGs and where academies can get involved.

The guide can be accessed <http://www.interacademies.org/>.

Dr Elliott further noted that there are opportunities for young scientists to contribute to the UN SDG process. The summary of the STI Multi-stakeholder Forum held in May 2017 stated that:

- scientists must better understand policy and policymaking processes;
- that a diversity of scientists must be incentivised and mobilised to support evidence-based policymaking;
- academies of science and related organised science groups should be encouraged to take an active role in national STI policy processes and in identifying needs and gaps.

In addition, the Science and Technology Major Group at the HLPF on Sustainable Development (14 July 2017) underlined the importance of engaging young scientists in the science/policy/practice interface and the importance of capacity development for integrated science for sustainable development.

Discussion

Mr Donovan Guttieres: Specific UN agencies are tasked with the review and progress of specific SDGs. It is good to know which agencies are reviewing each of the SDGs. This might also be an avenue of input since the agencies host stakeholder panels and expert group meetings that are sometimes open.

Dr Connie Nshemereirwe: Most of us will be wondering where we can contribute as academy members and as scientists. Are we willing to engage and do we have the capacity to engage? As scientists, one thing we can do is to generate evidence. We should look at how our work contributes to the SDGs and translate research related to the SDGs into easy-to-read articles in newspapers, for example.

Prof Collet Dandara: National governments release statements for discussion. Scientists should mobilise and look at what is relevant to science and make contributions to these statements. This will feed into the SDG process. It is no use complaining that government does not consult scientists if we are not proactive in this regard.

Possible ways the NYAs and the GYA can get more involved in SDGs policy implementation

- Talk about the SDGs within the academies and reach out to communities to raise their awareness.
- Re-align or embed SDGs in academies' programmes/initiatives.
- Explore studies that identify SDGs/targets where evidence is weaker or needs development, or that looks at complementarities, gaps and trade-offs across SDGs (for example, ICSU reports of 2015, 2017).
- Where they exist, use the Voluntary National Reviews (VNRs) as a guide for academy initiatives, or challenge them and bridge the gap between supply and demand.
- Engage your universities and host research institutions, encouraging them to get involved or re-align their teaching curricula or research priorities; look at ways to incentivise researchers to get involved.
- Have conversations with user communities and co-design (co-frame) projects together.
- Help facilitate/initiate STI action plans/road maps for national SDG implementation and review.
- Draw on our collective strengths: How can we use this meeting and regional NYA meetings to influence/feed into UN SDG processes?

- Become a recognised, institutionalised but independent part of your national, regional and global advice systems.
- Challenge conventional methodology.

Brainstorming priorities for the 3rd WWMNYA statement

Delegates suggested that the following priorities should be addressed in the statement from this meeting:

- Scientific leadership.
- Academic freedom and the threat of liberties in general (reintroduction of borders).
- Mobility and research visa.
- Science unites people globally and does not know borders.
- The complex problems and challenges faced globally today require collaboration among countries and disciplines in order to work towards solutions, particularly long-term solutions.
- A clear indication of the potential that lies in NYAs working within regions to generate evidence that contributes to understanding issues specific to the regions in the SDG framework.
- A declaration of the NYAs' commitment to address the complex challenges in line with the SDGs.
- Realising the ecosystem of science, policy and society. Scientists should not isolate themselves in this dialogue and recognise that they need to enhance their capacities as scientists to contribute to sustainable development but also to call on governments and policymakers to enhance their receptiveness to science, or agencies to fund science, and from society's side, to build citizen science.
- A possible statement title could be Science without Borders.
- Staying in touch with society outside of science.
- Be good role models for diversity, particularly gender issues and inclusion.
- Communication of research and relationship with the media.
- Engaging with various stakeholders and increasing public trust in science.
- Science and politics (scientists' involvement in politics).
- Emerging issues (horizon-scanning).

It was agreed that the statement would be inspirational and that the above list is not conclusive.

Note: See the Conference Statement.

The future of the GYA and the global NYA network

Delegates were asked to think about where they would like to see the NYAs and the GYA in five and ten years' time. They imagined the following characteristics for future NYAs and the GYA:

- Much more of an interactive fabric, moving beyond talking about the same things at every meeting.
- Global science organisations driving global agendas.
- Influential organisations of scientists, increasing the efficiency of all other science-related organisations.
- The legitimate authority (rather than a mere association) on matters of science and science policy.
- Independent and strong entities that are able to cooperate with the senior academies.
- Taken seriously by senior academies.
- More involved in decision-making and have a voice in respect of scientific matters (in Africa).
- More visible, more productive, more interactive and activity-based.
- Unafraid of failing, reinvent themselves, explore all ideas voiced by new members, stay fresh, keep momentum and avoid the inertia that can come with rigid structures.
- Implementing changes from the beginning and adapting to changing environments.
- Inclusive of less experienced young scientists.

In addition, the NYAs and the GYA will need to move beyond discussions to becoming active citizens of the respective countries. There ought to be an implementation plan to ensure that the outcomes of this meeting are taken forward in the next five years, and a clear guideline must be in place to strengthen the NYAs over the next ten years.

Dr Elliott assured delegates that the discussions within the UN were advancing. A call had been made for a transformative shift in how STI is practised, valued and rewarded; a shift increasingly from competition to collaboration, from working in isolated professional communities to integrated communities that provide different types of knowledge, from the notion of working for society to working with society openly and inclusively, and in short, changing the practice of STI to a public enterprise for the global public good.

The IAP project's Academies Survey 2016/7 showed that academies feel they can best support the SDGs through policy advice, providing expertise and helping to shape research programmes. Another survey in five years'

time would perhaps show that young academies best support the SDGs through partnership, co-design, collaboration, integration and facilitation, driven through their outreach strengths and excellence.

CLOSING

Prof Riede, on behalf of the organising committee, thanked all the delegates for their valuable participation and contributions to the meeting.

SCIENCE OF HOPE

There was a certain chemistry when young scientists from over 35 countries met Science Spaza science club members in the East Rand township of Tsakane near Brakpan on the East of Johannesburg. Bringing together the young scientists and learners inspired hope for both groups and demonstrated the power of science engagement to gain new perspectives on old challenges.

How can spaces be created for scientists to engage in conversations with the public? In particular, how can scientists talk to young people to inspire and encourage them to pursue careers in science, technology, engineering and mathematics (STEM), and how do they, in turn, hear about the challenges and difficulties these young people face? These were some of the questions on the minds of the delegates of the 3rd Worldwide Meeting of National Young Academies of science (NYAs), and the purpose of the science outreach and engagement to the African School for Excellence.

The outreach and engagement was a SAYAs-led initiative, which partnered with the Science Spaza Science Clubs programme to facilitate the afternoon's proceedings. The 50 learners from two independent science clubs, the African School of Excellence science club and the Yael Science Club (Isaac Newton School in Johannesburg) were waiting patiently when the delegation of 60 young scientists walked through the door.

Hands-on activities are the hallmark of the Science Spaza experience, and soon the air was thick with paper planes, while the young scientists tried to explain and understand the scientific principles at work. The activities served to break the ice and set the scene for an invigorating discussion between the two generations, which proved to be competitive too at times, but all in good spirit.

The scientists asked the young scholars how they motivated themselves, and to name the biggest obstacles they face in achieving their dreams.

The responses ranged from a lack of supportive parents, funding, a lack of belief in themselves and a lack of clear focus. The scientists then shared insights and experiences about how to overcome and avoid these obstacles including perseverance, hard work, setting goals, choosing the right people to support you and avoiding risks and pitfalls such as teenage pregnancy. Learners challenged scientists to continue their work in developing a cure for HIV, giving more consideration to the environmental impact of their research and to never stop being curious.

The 3rd Worldwide Meeting of NYAs, which took place in Johannesburg from 20 to 21 July was hosted by SAYAS, an affiliate organisation of the Academy of Science of South Africa (ASSAf). SAYAS represents the voice of young scientists in South Africa on national and international matters and provides a platform for young scientists to influence policy decisions.

This 3rd Meeting of NYAs was co-organised with the Global Young Academy (GYA) which is a global body that represents the voice of young scientists around the world. It works to empower early-career researchers to lead international, interdisciplinary, and intergenerational dialogue by developing and mobilising talent from the six continents. Its purpose is to promote reason and inclusiveness in global decision-making.

The meeting of NYAs under the theme One Health – Health and Development in the Context of an Urbanising Planet and Implications for Science Policy focused on sustainable development goals (SDGs) 3 (Good Health and Well-Being), 8 (Decent Work and Economic Growth) and 11 (Sustainable Cities). It explored the role of NYAs as a mechanism for national implementation of the SDGs, and how science and technology can be harnessed towards achieving the UN SDGs.

The Science Spaza Programme is a network of over 150 self-initiated science clubs across South Africa. The programme is a response to the desperate shortage of opportunities for young people to undertake hands-on science learning. Science Spaza brings science to the people through activity-based learning resources delivered to their schools at the start of each school term.

As the sun dropped low, and Tsakane township became bathed in a golden light, delegates boarded their busses and were driven away. They are taking with them the hopes and dreams of the next generation of scientists – and are already thinking of ways to make the world a little bit safer, for everyone.

About Science Spaza

Science Spaza is an initiative of science communication agency, Jive Media Africa, supported by the Department of Science and Technology and other science agencies in South Africa. Started in 2013, the initiative exists as an open invitation to sign up a Science Spaza science club to receive activity based print resources. To date over 150 science clubs have signed up and the number is growing rapidly. Access: www.sciencespaza.org

Note: This article written by Robert Inglis, Jive Media and Edith Shikumo, SAYAS Secretariat, was published in the Mail & Guardian July 28 to August 3, 2017 edition.



LIST OF ACRONYMS

3MT	Three Minute Thesis
AMU	Polish Young Academy
ANAS	Azerbaijan National Academy of Sciences
ART	Antiretroviral therapy
ASEAN	Association of Southeast Asian Nations
ASME ISHOW	American Society of Mechanical Engineers Innovation showcase
ASSAf	Academy of Science of South Africa
AU	African Union
AWARD	African Women in Agricultural Research and Development
BBAW	Brandenburg Academy of Science and Humanities
BRICS	Brazil, Russia, India, China, South Africa
COSTI	Coordinating Secretariat for Science, Technology and Innovation
DST	Department of Science and Technology
EU	European Union
ExCo	Executive Committee
GenderInSITE	Gender in Science, Innovation, Technology and Engineering
GloSYS	Global State of Young Scientists
GSDR	Global Sustainable Development Report
GYA	Global Young Academy
HIV	Human immunodeficiency virus
HLPF	(UN) High-level Political Forum
HSRC	Human Sciences Research Council
IAP	InterAcademy Partnership
IBSE	Inquiry-based science education
ICSU	International Council for Science
INGSA	The International Network for Government Science Advice
IP	Intellectual property
KNYAS	Kenya National Young Academy of Sciences
LDC	Less-developed country
NASAC	Network of African Science Academies
NASSL	National Academy of Sciences of Sri Lanka
NCDs	Non-communicable diseases
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental organisation
NRF	National Research Foundation
NSI	National System of Innovation

NYA	National Young Academy
OWSD	Organisation for Women in Science for the Developing World
PAS	Polish Academy of Sciences
PSN	Polish Scientific Networks
R&D	Research and development
RCR	Responsible Conduct of Research
SADC	Southern African Development Community
SAJS	South African Journal of Science
SAYAS	South African Young Academy of Science
SDG	Sustainable Development Goal
SLAYS	Sri Lankan Academy of Young Scientists
SLP	Science Leadership Programme
STEM	Science, technology, engineering and mathematics
STI	Science, technology and innovation
TB	Tuberculosis
TFM	Technology Facilitation Mechanism
TWAS	The World Academy of Sciences
TYAN	TWAS Young Affiliates Network
UCT	University of Cape Town
UK	United Kingdom
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
UN MGCY	UN Major Group for Children and Youth
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USA	United States of America
VNR	Voluntary National Review
WEF	World Economic Forum
WWMNYA	Worldwide Meeting of the National Young Academies
YSN-ASM	Young Scientists Network-Academy of Sciences Malaysia
YSSC	Young Scientists and Specialists Council

LIST OF DELEGATES

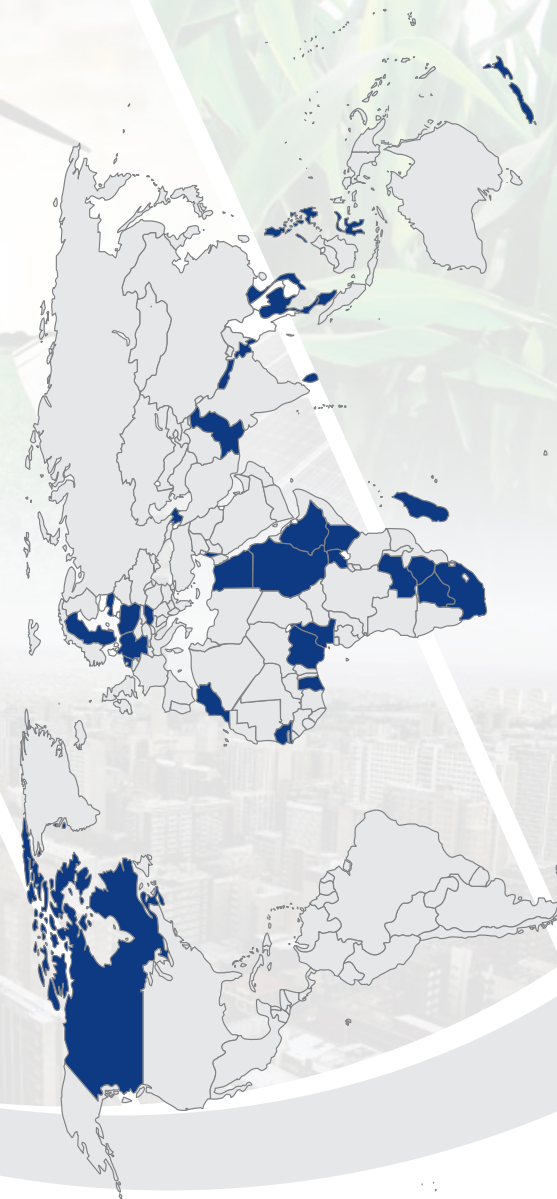
Name	Organisation
Mr Badre Abdeslam	NYA Initiative – Morocco
Dr Monir Uddin Ahmed	NYA Initiative – Bangladesh
Prof Esther Akinlabi	SAYAS
Dr Patrick Arthur	Ghana Young Academy
Dr Yousuf Hasan Bakhit	Sudanese Academy of Young Scientists
Prof Annelien Bredenoord	Young Academy of the Netherlands/ <i>De Jonge Akademie</i>
Dr Siyavuya Bulani	ASSAf
Dr De Ming Chau	Young Scientists Network – Academy of Sciences Malaysia
Dr Chai Lay Ching	Young Scientists Network – Academy of Sciences Malaysia
Dr Karen Cloete	SAYAS
Ms Jia Cong Ang	UN-Habitat, Kenya & UN MGCY
Dr Anna Coussens	GYA
Prof Robin Crewe	University of Pretoria
Prof Collet Dandara	The World Academy of Sciences – The Young Affiliates Network
Dr Meghnath Dhimal	NYA Initiative – Nepal
Prof Maribel Dionisio-Sese	Philippine Academy of Young Scientists
Dr Victorien Dougnon	The World Academy of Sciences – The Young Affiliates Network
Dr Tracey Elliott	IAP
Dr Ayman Elsayed	Egyptian Young Academy of Sciences
Ms Heather Erasmus	Scribe
Mr Ochuko Erukainure	Nigerian Young Academy
Prof Helena Filipsson	Young Academy of Sweden
Mr Andris Freimanis	Association of Latvian Young Scientists

Name	Organisation
Prof Peter Fritz	IAP, German National Academy of Sciences Leopoldina
Ms Nomasomi Gasa	International Council for Science – Regional Office for Africa
Ms Anna-Maria Gramatté	GYA Office
Mr Donovan Guttieres	MIT Global Poverty Initiative & UN MGCY
Dr Tran Quang Huy	Vietnam Young Academy
Dr Talla Mbe Jimmi	NYA Initiative – Cameroon
Ms Phyllis Kalele	ASSAf
Mr Armel Kamenyero	Burundi Council of Young Scientists
Dr Lawrence Kazembe	The World Academy of Sciences – The Young Affiliates Network
Prof Monika Kędra	Polish Young Academy
Dr Alan Koropitan	Indonesian Young Academy of Science
Ms Munashe Kurehwatira	Zimbabwe Young Academy of Science
Dr Robert Lagerström	Young Academy of Sweden
Mr Adam Linnell	New Zealand High Commission, South Africa
Mr Russel MacDonald	College of New Scholars, Scientists, and Artists, Canada
Prof Ndiaye Magatte	<i>Académie Nationale des Jeunes Scientifiques du Sénégal</i>
Ms Awodwa Magingi	Department of Water and Sanitation, RSA & UN MGCY
Mr Numpon Mahayotsanun	Thai Young Scientists Academy
Prof Makondelele Makatu	SAYAS
Ms Marvin Mandiwana	ASSAf
Mr Stanley Maphosa	ASSAf
Ms Phatsimo Matshediso	Botswana Institute for Technology Research and Innovation
Mr Kholani Mbhiza	ASSAf
Dr Binyam Sisay Mendisu	GYA, Ethiopian Young Academy of Science
Mr Odwa Ntsika Mtembu	World Merit & UN MGCY

Name	Organisation
Dr Robinson Juma Musembi	Kenya National Young Academy of Sciences
Dr Syed Ghulam Musharraf	National Academy of Young Scientists-Pakistan
Dr Tufaria Mussa	The World Academy of Sciences – The Young Affiliates Network
Mr Joseph Mwale	NYA Initiative – Zambia
Dr Vidushi Neerghen-Bhujun	NYA Initiative – Mauritius
Ms Dorothy Ngila	OWSD-SANC/National Research Foundation
Dr Nosiphiwe Ngqwala	SAYAS
Mr David Niyukuri	Burundi Council of Young Scientists
Ms Nomfundo Nkosi	ASSAf
Dr Connie Nshemereirwe	Uganda National Young Academy
Mr Shaikh Saqib Rafique	National Academy of Young Scientists-Pakistan
Ms Chanel Rampartab	OLSPS Marine, Sustainable Oceans Alliance & UN MGCY
Dr Moritz Riede	GYA
Ms Tabinda Salman	National Academy of Young Scientists – Pakistan
Dr Marion Schulte zu Berge	<i>Junge Akademie, Germany</i>
Mr Farid Seyfullayev	Young Scientists and Specialists Council of Azerbaijan National Academy of Sciences, Azerbaijan
Ms Edith Shikumo	ASSAf/SAYAS Secretariat
Dr Samuel Sojinu	GYA
Prof Udi Sommer	Israeli Young Academy
Prof Molibeli Taele	GYA and TWAS Young Affiliates (Alumni)
Dr Tharanga Thoradeniya	Sri Lankan Academy of Young Scientists
Mr Moolisa Tlali	IMCS pax Romana & UN MGCY
Dr Gergely Toldi	NYA Initiative – Hungary

Name	Organisation
Dr Merritt Turetsky	College of New Scholars, Scientists and Artists, Canada
Ms Renate Venier	ASSAf
Ms Henriette Wagener	ASSAf
Dr Beate Wagner	GYA Office
Dr Chamindri Witharana	Sri Lankan Academy of Young Scientist
Dr Sahal Yacoob	SAYAS
Dr Mariamawit Yonathan	Ethiopian Young Academy of Sciences

Representation of NYAS and similar initiatives who attended this meeting





For more information on the 3rd Worldwide Meeting of Young Academies, hosted by the South African Young Academy of Science (SAYAS) and co-organised by the GYA, and its outcomes, see: <https://globalyoungacademy.net/events/3rd-worldwide-meeting-of-young-academies-2017/>

Contact Global Young Academy, c/o German National Academy of Sciences Leopoldina, Emil-Abderhalden-Straße 37, 06108 Halle (Saale), Germany <https://globalyoungacademy.net/>



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