

JEDDAH DECLARATION OF TWAS FIFTEENTH GENERAL CONFERENCE

Adopted on 4 November 2021

Preamble

The Fifteenth General Conference of The World Academy of Sciences (TWAS) for the advancement of science in developing countries was successfully convened online and coordinated from the King Abdullah University of Science and Technology (KAUST) in Jeddah, Saudi Arabia, along with TWAS Secretariat in Trieste, Italy, from 1 to 4 November 2021.

We, the participants, focused on the theme of "Advancing frontier science, technology and innovation for the SDGs in developing countries".

We, the participants to the Conference:

Recognizing the vital role that science, technology and innovation play in addressing global challenges, such as efforts to eradicate poverty, achieve food security, fight diseases, improve education, facilitate access to clean energy, accelerate economic growth, protect the environment, and ultimately support sustainable development, particularly in the least developed and science- and technology-lagging countries;

Recognizing that science, technology and innovation are vital for the implementation of the 2030 Agenda for Sustainable Development and the achievement of the [17 Sustainable Development Goals](#) (SDGs), which aim to achieve socially inclusive economic development within the boundaries of the Earth's capacity to sustain human activity;

Inspired by the transformative vision of Sustainable Development Goal 17, unique in that it encompasses all the other goals, calling, as it does, for a revitalization of global partnerships for sustainable development;

Further inspired by target 6 of Sustainable Development Goal 17 on enhancing North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation, and on enhancing knowledge-sharing;

Recognizing the central role that TWAS must play in supporting scientific excellence, by helping to build research capacity in the developing world, and by actively participating, in partnership with other international scientific organizations and miscellaneous stakeholders, in the endeavour to tackle the global challenges addressed by the SDGs;

Reaffirming the Academy's will, in the next four years, to pay special attention to promoting science-technology-and-innovation (STI) strategies and policies for the implementation of the SDGs, as outlined in Strategic Priority 6 of "TWAS Sixth Strategic Plan (2021-2025)" on promoting STI and science-policy-diplomacy links for the achievement of SDGs;

COVID-19

Considering that the outbreak of the COVID-19 pandemic showed the importance of making advances in science and technology available and accessible to all;

Considering also that, in light of the consequences of the global COVID-19 pandemic, strengthening multilateralism and global partnerships is of critical importance;

Recognizing that the SDGs remain the framework for building back better jointly with governments, civil society, scientists, academia and the private sector;

Considering that COVID-19 revealed that there is extensive room for improvement in the way science and technology are harnessed worldwide to resolve global challenges, and that achieving the SDGs by 2030 requires most countries to swiftly realign their national priorities towards collaborative and longer-term planning;

Recognizing the importance of the connection between the pandemic recovery and contributions of science towards SDGs, the realization of which would be impossible without international cooperation;

Recalling TWAS [Statement on Covid-19](#), released on 9 April 2020, which indicated that solutions must include medical professionals, public health officials tracking the virus, and researchers engaged in the development of treatments, because health-service disruptions could reverse decades of improvement and affect peoples' health for years to come, particularly in the developing world;

Recognizing that unless we share the vaccine globally, we will continue to share the virus, and that in the present global society one is safe only until everybody is safe;

Open science

Recalling the principles of 'open science', as outlined in UNESCO draft Recommendations on the development of the first international [standard-setting instrument on open science](#) and adopted by consensus in May at an intergovernmental meeting that saw the participation of 106 countries represented by 230 experts;

Recalling that those recommendations will be submitted for final adoption by all 193 UNESCO Member States to UNESCO Forty-first General Conference, taking place from 9 to 24 November;

Noting that 'open science' means promoting collaboration across disciplines and, above all, across geographies, and that this is particularly critical for developing countries, "where resources are scarce, scientific infrastructure remains underdeveloped, and health-care services are under-resourced"—countries that may otherwise find it difficult to participate in the latest research;

Recalling that TWAS is one of the science stakeholders in [UNESCO Global Open Science Partnership](#);

Recalling also Article 27 of the [Universal Declaration of Human Rights](#) which affirms that: "Everyone has the right freely [...] to share in scientific advancement and its benefits";

Call, therefore, for an ambitious commitment of all stakeholders and unanimously declare that:

On curbing and reversing inequalities

- Encourage long-term and continued investment in science institutions and programmes focusing on developing countries, so as to reduce global inequalities, such as poverty or unequal access to health. According to United Nations data, three

quarters of people who do not have access to electricity are in Sub-Saharan Africa: inequalities worldwide continue to exist and many least developed countries need greater and better support.

- With the same aim of reducing inequalities, science institutions, on their side, shall promote and encourage exchanges among scientists—South-South, North-South, and South-North.

On energy, climate change, and green technologies

- Given the interlinks between energy and climate, decarbonization efforts must increase to speed up the process of ecological transition. Methane emissions should be taken into account routinely in all processes, discussions and decisions on green technologies, as they play a crucial, but often overlooked, role in climate change
- The unsustainable use of resources is another global pandemic: all countries must become more accountable for their footprint on the planet. Agri-food systems also need to be reprogrammed according to sustainable practices.

On biodiversity, biotechnology, and health

- Biodiversity is well known for its potential in drug discovery, and this has tremendous potential for developing countries. It is a most valuable resource for human civilization: it must be re-evaluated in all its forms with the new knowledge emerging from recent scientific research, for instance regarding soil biodiversity. It is a true frontier of science: it can teach us important principles that can help us solve real-life problems, for example in relation to plant health and food production.
- Biotechnology has a wide range of applications, useful for health, renewable energy, and food security, particularly for developing countries. This should be made clear to society and policymakers.

On gender

- Build on the concept of gender-responsive scientific organizations, namely organizations that raise gender equality higher on their agenda; help achieve parity by sharing examples of good practices, and establish short- and long-term mechanisms for more inclusive assemblies; create enabling and inclusive environments for meaningful and substantive participation of women and the advancement of gender equality; promote and encourage gender equality at the senior level; develop and apply policies that advance gender equality. Such an approach is particularly needed in science.
- Academies around the world to promote gender responsiveness commitments, allocation of funds and, more importantly, actions to transform the behaviour of institutions, at all level, but particularly at the highest level of management, and achieve and encourage gender equality.

On COVID-19

- COVID-19 has increased poverty with over 150 million more people in poverty: solidarity is an ethical duty for wealthier countries to support least developed countries.
- Inequality has been clearly highlighted by COVID-19 also in terms of vaccine access and distribution: unless we share the vaccine globally, we will continue to share the virus.
- The benefits of the scientific success that brought the first COVID vaccine in nine months were unequally distributed: only 5 per cent of the African population is vaccinated, and many developing countries are still left behind.

- Preparedness is key to address future pandemics: this requires international collaboration and conferences involving participants from developed and developing nations, as well as an efficient global governance ready to promote the fast dissemination of knowledge and the distribution of tests and vaccines.

On science literacy and information:

- The pandemic highlighted that entire groups of society worldwide are negatively affected by, and act upon, fake news and conspiracy theories, known as *infodemic*—too much information, including false or misleading information in digital and physical environments, during a disease outbreak. Such information creates confusion, and brings about risk-taking behaviours that can harm health, leads to mistrust in health authorities and science, and can thus intensify or lengthen outbreaks. The promotion of the systematic use of risk- and evidence-based analysis and scientific approaches to reduce the negative impact of infodemic on health behaviours is thus crucial. Misinformation kills: scientists and policymakers need to communicate and cooperate more than ever before. This requires a special effort to overcome science illiteracy.
- Science institutions, in cooperation with policymakers, should promote basic and non-basic science literacy globally, at the level of laypersons, investing in and promoting science communication targeting scientists. Scientists' ability to convey the principles and outcomes of science is crucial in spreading, shaping and consolidating science literacy in non-scientific communities worldwide, ranging from policymakers to the general population.

On digital inclusion:

- International organizations and scientific societies should help digital inclusion through the dissemination of affordable equipment and educational techniques based on digital practice. While digital transformation is opening opportunities for advancing social progress and fostering social inclusion, it is simultaneously exacerbating the risk of increased inequalities and exclusion of those who are not digitally connected, namely the offline population, which is disproportionately female, rural, poor, comprised of older persons, and/or with limited education and low literacy.

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REPORT ON THE TWAS FIFTEENTH GENERAL CONFERENCE AND ITS TWENTY-NINTH GENERAL MEETING

TWAS Fifteenth General Conference and its Twenty-ninth General Meeting were the culmination of months of planning and fruitful cooperation between TWAS team in Trieste and KAUST team in Jeddah. This has been indeed an auspicious time.

In the course of our meeting, we made significant accomplishments:

The Ministerial Session largely revolved around global inequality and inequity in science, and global challenges, as well as progress achieved so far. Speakers discussed challenges and opportunities of research-and-development spending, national policies on science, technology and innovation, and looked at how frontier science can have an impact on inequalities. Participants shared some successful examples of how frontier science contributed to reducing inequalities in their own countries and included examples on facilitating access to clean water, sanitation, nutritious food, renewable energies and quality education, among others. Key topics of debate were the ongoing COVID-19 pandemic, which the speakers agreed has highlighted the important concept of "one health", as well as the global challenges of climate change and the overwhelming importance of increasing science literacy in both the general public and among governing bodies.

We were honoured to welcome Nobel laureate Prof. Jean-Marie LEHN of France, who delivered, on the first day of the Conference, a very engaging high-level lecture on chemistry, and Prof. Carlos NOBRE of Brazil, one of the authors of the Fourth Report of the Intergovernmental Panel on Climate Change (IPCC), which received the Nobel Peace Prize in 2007. Prof. Nobre spoke at Symposium 1, on 2 November, on the very topic of the Conference itself— advancing frontier science, technology and innovation for the SDGs in developing countries. This Symposium emphasized themes related to energy and climate change. In particular, the following points were stressed:

- Increasing the earth temperature between 1.5–2°C will have a catastrophic global impact
- Energy sources are the main reasons for climate change. Energy sources of carbon emission have a severe negative impact on climate-warming issues, agri-food systems, genetic diversity, soil quality, shifting in agricultural seasons, pest disease, animal health and food security. As an example, 70 per cent of the Amazon forest is dying due to fires and deforestation, which cause a warmer global climate, lead to dry and hot seasons, and increase the mortality of the organisms thus leading to change in the socio-biodiversity
- In order to advancing science, engineering, stockholders and the public need to bring their efforts to achieve SDG 7 on atmospheric and clean energy, which has a direct impact on SDG 13 on climate change
Renewable and new green sources need to be found, considering that, for instance, 75 per cent of Sub-Saharan population has no electricity, while the rest of the population worldwide suffers from financial energy stress due to the high electricity bills cost.

Symposium 2 on COVID-19, held on 3 November, featured four eminent academicians from the four corners of the world illustrating how the COVID-19 pandemic impacted on the health of both the people and the economies of their respective regions. The importance of equity in health was stressed, as well as the needs to have a shared vision, shared responsibility, solidarity and leadership, as only with them the course of the pandemic could be changed, similarly to what was done for HIV, which has now become a chronic manageable disease.

Countries, however, are reluctant about vaccine-sharing. It is ironic that while vaccines are not shared and developing countries in Africa are in need, more than one million doses are expiring in stock and will go wasted. It was also highlighted that poverty has increased: because of COVID-19, there are over 150 million more people living in poverty now; the World Food Programme (WFP) estimates that 16 million people have become food insecure; fake news and conspiracy theories have spread and “Infodemic” has hit everybody; political instability and protests against lockdowns and restrictions have occurred in many places; and race, gender, and social disparities have become more obvious, affecting access to resources (e.g. data and vaccines). It was pointed out that preparedness for a possible next pandemic should be high on countries' agenda.

Symposium 3, held on 4 November, underlined that COVID-19 has been accelerating the pace of digital transformation. While digital transformation is opening opportunities for advancing social progress and fostering social inclusion, it is simultaneously exacerbating the risk of increased inequalities and exclusion of those who are not digitally connected, namely the offline population, which is disproportionately female, rural, poor, comprised of older persons, and/or persons with limited education and low literacy. This is particularly pronounced in developing countries and it was accentuated by the COVID-19 pandemic, affecting poor students who could not attend virtual classes, for lack of equipment or of proper space to study.

As for our outstanding awardees, for almost forty years, TWAS has honoured exceptional scientists from developing countries, all with reputations based on years of research. In recent years, additional awards have been added to recognize the importance of scientists from younger generations and of female scientists. It has been a heartening experience to see dozens of excellent, passionate scientists from developing countries receive awards for their hard work. We could choose just some among them, but many more are already serving as shining examples to improve living standards in their own countries and regions, be it in Africa, South America or Asia. Let's keep supporting all of them. As encompassed in TWAS very mission and reaffirmed over the last four decades, TWAS latest strategic plan will reinforce these endeavours.

This has been a rich and rewarding meeting. It has been an inspirational window on the scientific work that is under way throughout the developing world. Furthermore, it has renewed the hope that, through our commitment, support and constant hard work, science will continue to contribute to building stronger communities and a healthier planet in developing countries and across the world.

Agreed to by TWAS Fellows in attendance at the Fifteenth General Conference and the Twenty-ninth General Meeting of The World Academy of Sciences (TWAS) for the advancement of science in developing countries, 4 November 2021.