SCIENTIFIC AND TECHNOLOGICAL COMMUNITY MAJOR GROUP POSITION PAPER

FOR THE 2022 HIGH-LEVEL POLITICAL FORUM

Building back better from the coronavirus disease (COVID-19) while advancing the full implementation of the 2030 Agenda for Sustainable Development

June 2022

Scientific and Technological Community Major Group position paper for the 2022 High-level Political Forum

Building back better from the coronavirus disease (COVID-19) while advancing the full implementation of the 2030 Agenda for Sustainable Development

Key messages

- **Two years into the COVID-19 pandemic, the world finds itself at an inflection point greater than at any time since the end of World War II, threatened not only by dangerous systemic risks due to climate change and other related environmental crises, but also by the harrowing impacts of the Russia-Ukraine war.** At a time when international cooperation is essential to solve the most pressing problems of our interdependent societies, the ongoing conflict is threatening to derail all global efforts to tackle those problems and to achieve a resilient, just and sustainable world for everyone. The STC Major Group expresses its deep dismay and concerns regarding the military confrontation, which is something that no country and community in the world can afford[1,2].

- **Despite the pandemic being a systemic event, responses by most governments are still largely focused on health measures and offer insufficient measures to remedy the broader impacts on societies.** While current policy measures are focused on addressing the immediate crisis and on the short-term consequences, decisions taken today will influence the long-term pandemic outcomes, and a longer-term perspective is crucial[3]. The pandemic is first and foremost a global crisis, and well-thought-out national strategies to address COVID-19 must be accompanied by international collaboration and solidarity.

- **Despite a growing and shared concern about the convergence of environmental tipping points, environmental degradation is accelerating[4].** The unprecedented mobilization of governments to respond to COVID-19 does not appear to have greatly served the cause of sustainability, despite repeated pledges on creating a green and sustainable recovery[5].

- **The impact of the systemic risk of COVID-19 also highlights the urgent need to better understand systemic risks to our ocean, and to prepare responses to future crises which threaten the stability of our climate.** Major shifts in the state of the ocean will far exceed the

[1] International Science Council Statement on Ukraine: https://council.science/current/news/isc-statement-ukraine/

[2] World Federation of Engineering Organizations Statement on Ukraine: https://www.wfeo.org/world-federation-of-engineering-organizations-statement-on-ukraine/

[3] International Science Council, 2022. *Unprecedented & Unfinished: COVID-19 and Implications for National and Global Policy*. Paris, France, International Science Council. https://doi.org/10.24948/2022.03.

[4] Reflections on sustainability. *Nat Sustain* **4,** 921 (2021). https://doi.org/10.1038/s41893-021-00821-4

[5] Strand, Roger & Kovacic, Zora & Funtowicz, S. & Benini, Lorenzo & Jesus, Ana. (2022). COVID-19: lessons for sustainability?. https://doi.org/10.2800/289185

social and economic consequences of the pandemic[6]. In 2022 governments must urgently take significant, collective action to protect and revitalize the ocean.

- **Long-term recovery from COVID-19 must include the restoration of ecosystems and a transformation of our relationship to nature in ways that are just and sustainable.** Scientific research on the dynamic and multi-faceted people-nature relationships should be placed at the centre of decision- and policy-making[7] to inform restoration activities and alternative pathways for development in harmony with nature.

- **COVID-19 sparked a global learning crisis as almost all countries severely restricted in-person access to education in the course of the pandemic. The detrimental impacts on education are an enduring legacy of the pandemic.** Successive entrants into the labour force will have an educational deficit which will, in turn, have significant negative impacts upon future productivity. Policies to mitigate the negative impacts of the pandemic on education should therefore be very high on the agenda of policy-makers everywhere.

- **With the pandemic still unfolding and extreme weather- and climate-related events increasing, a much stronger and more nimble partnership between science, policy and practitioners is required to address rapidly evolving situations with multiple drivers and varied impacts at national and local scales.** There is an urgent need to commit to support the development of scientific capacities in all parts of the world, to advocate open science policies and practices, and to increase international, interdisciplinary scientific collaboration if we are to achieve the Sustainable Development Goals (SDGs) by 2030.

---

[6] Murphy EJ, Robinson C, Hobday AJ, Newton A, Glaser M, Evans K, Dickey-Collas M, Brodie S and Gehlen M (2021) The Global Pandemic Has Shown We Need an Action Plan for the Ocean. *Front. Mar. Sci*. 8:760731. https://doi.org/10.3389/fmars.2021.760731

[7] ISC President Statement for the Special Session to commemorate the 50th Anniversary of the UN Environment Programme: https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/38659/Peter%20Gluckman%20ISC%20UNEP%4050%20statement.pdf?sequence=1&isAllowed=y

HIGH-LEVEL POLITICAL FORUM
ON SUSTAINABLE DEVELOPMENT

International
Science Council

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

Introduction

The COVID-19 pandemic has brought unprecedented disruption to lives and businesses around the world with massive adverse health and socio-economic impacts for societies worldwide. The crisis has further exposed vulnerability to shocks, particularly among the poor and marginalized, feeding off existing inequalities and exacerbating them[8], undermining the aspiration of the 2030 Agenda of 'leaving no-one behind'. Economic gains and opportunities continue to be unequally distributed, while costs and impacts associated with climate change and biodiversity destruction are increasing exponentially and disproportionately affecting the most vulnerable and poor, particularly in low-income countries.

Although COVID-19 is a global and systemic crisis, governments' responses have focussed predominantly on national solutions and on health measures, which are insufficient to remedy its broader societal impacts[9]. A longer-term perspective at national, regional and global levels that is aligned with the global framework for achieving sustainable development provided by the 2030 Agenda is needed in order to shorten the course of the pandemic and mitigate its negative impacts. Unfortunately, the conflicts in Ukraine and elsewhere further threaten the ambition of achieving a sustainable and resilient recovery throughout the world, as well as the ability of countries to address global challenges in a coordinated and collaborative manner. Progress on the SDG agenda, which was already very slow before the COVID-19 pandemic and the ongoing conflicts, will potentially be set back by a decade or more.

In line with the focus of the High-level Political Forum (HLPF) for 2022 on building back better from COVID-19 while advancing the full implementation of the 2030 Agenda, this position paper brings together the latest scientific evidence and thinking from the scientific, engineering and technological community. It highlights policy domains that need to be prioritized in future if we are to advance process on the Sustainable Development Goals (SDGs) and be better prepared for the future as societies are facing a wide range of economic, technological, environmental and geopolitical challenges that go far beyond the coronavirus.

Building on the COVID-19 recovery and emerging lessons to achieve a sustainable and resilient future

1. **Two years into the COVID-19 pandemic, the world finds itself at an inflection point greater than at any time since the end of World War II, threatened not only by dangerous systemic risks due to climate change and other related environmental crises, but also by the harrowing impacts of the Russia-Ukraine war.** At a time when international cooperation is essential to solve the most pressing problems of our interdependent societies, the ongoing conflict is threatening to derail all global efforts to tackle those problems and to achieve a resilient, just and sustainable world for everyone. Peace and stability are key to achieving the 2030 Agenda.

---

[8] Folke, C. et al. 2020.Our Future in the Anthropocene Biosphere: Global sustainability and resilient societies. Beijer Discussion Paper Series No. 272.

[9] International Science Council, 2022. *Unprecedented & Unfinished: COVID-19 and Implications for National and Global Policy*. Paris, France, International Science Council. https://doi.org/10.24948/2022.03.

The STC Major Group expresses its deep dismay and concerns regarding the military confrontation, which is something that no country and community in the world can afford[10,11].

2. **Drawing lessons from the COVID-19 crisis is a meaningful exercise for developing understanding and mechanisms to address future risks, including another pandemic, climate change or major disasters.** For this pandemic, and to respond to future ones, studies of what determined individual and collective behaviour and compliance, impacts on mental health, the use and usefulness of modelling and different modes of science advice, as well as assessments of policy effectiveness and impacts should help inform preparedness planning for the future. From an international perspective, inquiries such as that conducted by the Independent Panel for Pandemic Preparedness and Response[12] have already highlighted critical areas where reform is needed.

3. **COVID-19 has highlighted the need to address the challenges of disinformation, and to strengthen pluralistic science advice systems to increase trust in science, thereby protecting societies from risks. The challenges of misinformation and disinformation have devalued science repeatedly throughout the pandemic.** Governments and the media need to collaborate to find new ways to monitor and mitigate disinformation flows, while also involving citizens in learning to recognize cues and think critically about information sources. In addition, it is also important for the science and engineering communities to engage more actively with local, regional, and national communities with a view to enhancing trust in science and engineering. Increased partnerships between academic institutions and news media outlets will help to strengthen trust in science, engineering and technology and inform the public.

4. **In many countries, a lack of a formal government science advice processes impacted their capacity to rapidly address the pandemic, which was characterized by large and evolving scientific components. While ad hoc advisory mechanisms were developed in many countries during the pandemic, having pre-existing mechanisms in place has considerable value, not just for emergency management but also for assisting with broader aspects of policy development**. Addressing the major challenges of the future at any level within the sustainability agenda will require science to be used more wisely and more effectively, and will depend on the ability of societies to take up scientific data and evidence to inform their national policy-making processes. This requires all countries of the world, regardless of their level of development, to develop their own science advice systems fit to their own culture and context.

5. **The COVID-19 crisis is not only a health crisis. Despite the pandemic being a systemic event widening global inequalities in terms of health, economics, development, science, engineering and technology, as well as social inequalities, responses by most governments are still largely focused on health measures and offer insufficient measures to remedy its broader societal impacts.** Governments are currently not prioritizing policies to improve fundamental government services such as public health system capacity, the provision of care for vulnerable populations, the state of education systems, and access to mental health services. Further critical factors include the spread of misinformation and its impact on societal decision-making,

---

[10] International Science Council Statement on Ukraine: https://council.science/current/news/isc-statement-ukraine/

[11] World Federation of Engineering Organizations Statement on Ukraine: https://www.wfeo.org/world-federation-of-engineering-organizations-statement-on-ukraine/

[12] https://theindependentpanel.org/

poor access to capital markets for low- and middle-income nations, the weakening of the multilateral system, and stalled progress on the SDGs.

6. **While current policy measures are focused on addressing the immediate crisis and on the short-term consequences, decisions taken today will influence the long-term pandemic outcomes, and a longer-term perspective is crucial**. It is essential that governments examine these decisions as they will shorten or prolong the course of the pandemic and mitigate or aggravate its negative impacts.

7. **The pandemic is first and foremost a global crisis, and well-thought-out national strategies to address COVID-19 and any other future pandemics must be accompanied by international collaboration and solidarity.** However, the commitment and capacity of the multilateral system to mobilize cooperation in order to respond to or prevent this crisis was suboptimal. Geopolitical issues confounded the response at some levels, and two years after the pandemic emerged there remain ongoing debates about technology and therapeutics transfer from the Global North to South.

8. **The COVID-19 pandemic has emphasized the need to build effective governance structures that would enable the world to respond collectively to shared global risks posed not only by COVID-19 and other infectious diseases, but also by ongoing environmental degradation, accelerating climate change, rapid technological change and rising inequalities.**[13] The COVID-19 pandemic offers a great opportunity to reconfigure the current multilateral system to become fairer and more inclusive.[14] As described by the UN Secretary-General, this renewed multilateralism must be geared towards the overarching goals of peace and security, human rights and sustainable development.[15] In order to benefit from increased legitimacy and citizen ownership, shaping the new multilateral system must be based on an inclusive process employing a whole-of-society approach.

9. **An important lesson brought by COVID-19 relates to the fact that governments need to focus their efforts on preventing risks of crises rather than managing events.** A common trait in most regions of the world was the lack of preparedness to face the COVID-19 pandemic. If our societies do not emerge from COVID-19 as more resilient, we increase risk by following old models of development, rather than investing in resilient, risk-informed, green, and more equitable societies. Societies need to recognize the need to better prevent and prepare, in order to attempt to stop hazards from becoming disasters. Investing in sustainable and resilient infrastructure will be important. Prevention for the climate crisis and potential future crises can no longer be an afterthought and must be considered as a high political priority at all levels, requiring investments in risk research and governance.[16]

---

[13] IIASA-ISC . 2020. Enhancing governance for sustainability. https://council.science/wp-content/uploads/2020/06/IIASA-ISC-Reports-Governance.pdf

[14] Foundation for European Progressive Studies. 2020. Renewing multilateralism for the 21st century. The role of the United Nations and the European Union. https://www.iai.it/sites/default/files/9782930769455.pdf

[15] UN News. 2020. COVID-19 highlights need for renewed, inclusive multilateralism. https://www.un.org/en/desa/covid-19-highlights-need-renewed-inclusive-multilateralism

[16] https://council.science/current/blog/the-climate-crisis-is-a-health-crisis/

10. **The COVID-19 pandemic, which is a clear realization of systemic risk, has highlighted that understanding and managing systemic risk is more important than ever due to our immense global connectivity, whether between sectors, such as food–health–water– energy, countries and continents, or even between individuals.**[17] Critical system interdependencies, amplified by underlying vulnerabilities, highlight that there is a growing need to better understand cascading impacts, systemic risks and the possible political (governance) and societal responses. This includes improving our understanding of the root causes of systemic risk, both biophysical and socio-economic, and related information needs. To address systemic risk through policy and governance, there is a need to foster system thinking and transdisciplinary approaches to engage a wide variety of stakeholders in efforts to map risk, as well as in identifying policy measures to deal with systemic risk in an anticipatory way to avoid realization of risk.[18]

SDG 4: Quality education

11. **COVID-19 sparked a global learning crisis as almost all countries severely restricted in-person access to education during the pandemic.** More than 1.5 billion students and youth across the planet are or have been affected by school and university closures. The detrimental impacts on education are an enduring legacy of the pandemic. Successive entrants into the labour force will have an educational deficit which will, in turn, have significant negative impacts upon future productivity. In addition, progress made for children and youth in other domains has stagnated or reversed. During school closures, children's health and safety was jeopardized, with domestic violence and child labour increasing. More than 370 million children globally missed out on school meals during school closures, losing what is for some children the only reliable source of food and daily nutrition. The mental health crisis among young people has reached unprecedented levels[19].

12. **The digital divide was manifest in every country, conferring further disadvantage to children and adolescents who did not have adequate digital access**. On top of that, digitally based pedagogy remains poorly developed in many areas, even in the third year of the pandemic. Many students in low-income situations had to choose between education and supporting their families in whatever way they could. Students in the later years of schooling and entering tertiary education have been particularly badly affected. Given this level of disruption, there is a need to increase government investment in digital infrastructure and design educational policies mainly targeted at those with no or very limited digital access to mitigate the negative consequences of the digital divide. To make digital technologies available to everyone, we have to break down both the hard barriers of digital infrastructure and the soft barrier of engineering capacity. To fill the gap, systematic efforts are needed in which appropriate engineering solutions are optimized for local conditions to ensure effectiveness, inclusion, eco friendliness and resilience.

---

[17] Gaupp, F. 2020. Extreme events in a globalized food system. One Earth, Vol. 2, pp. 518–521. https://doi.org/10.1016/j.oneear.2020.06.001

[18] Sillmann, J., Christensen, I., Hochrainer-Stigler, S., Huang-Lachmann, J., Juhola, S., Kornhuber, K., Mahecha, M., Mechler, R., Reichstein, M., Ruane, A.C., Schweizer, P.-J. and Williams, S. 2022. ISC-UNDRR-RISK KAN Briefing note on systemic risk, Paris, France, International Science Council, https://doi.org/10.24948/2022.01

[19] UNESCO; UNICEF; World Bank. 2021. The State of the Global Education Crisis : A Path to Recovery. UNESCO, Paris, UNICEF, New York, and World Bank, Washington, DC. © UNESCO, UNICEF, and World Bank. https://openknowledge.worldbank.org/handle/10986/36744

HIGH-LEVEL POLITICAL FORUM
ON SUSTAINABLE DEVELOPMENT

International
Science Council

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

13. **The COVID-19 crisis brought some important lessons for the global education community.** Remote and hybrid education have shown that transformation and innovation are possible; however, besides the development of digital infrastructures to enable the access of all including of those most disadvantaged, technology needs to be better leveraged to complement skilled and well-supported teachers. In addition, the transformation of education systems should ensure that learners become resilient to shocks caused by global risks and flexible to adjust to changing circumstances through critical thinking, adaptability, self-awareness, reflective learning and collaboration.[20]

14. **Policies to mitigate the negative impacts of the pandemic on education should be very high on the agenda of policy makers everywhere.** These policies should particularly be targeted at those groups of children who suffered most from educational disruptions. Critically, these would include those children who had limited or no access to education via remote means and children, especially girls, in vulnerable communities for whom the disruption in education may result, in the absence of remediation, in a permanent withdrawal from education. Governments have a huge opportunity to accelerate learning and make schools more efficient, equitable, and resilient by building on investments made and lessons learned during the crisis.

15. **National educational policies need to be accompanied by global cooperation mechanisms in education to ensure a better response to learning disruptions such as those experienced during the COVID-19 pandemic**. The STC Major Group welcomes UN Secretary-General António Guterres call for a [Transforming Education Summit](#) in September 2022 aimed at advancing global cooperation in education and at placing education at the centre of political agendas to ensure successful recovery from the COVID-19 pandemic and strengthened education systems throughout the world.

SDG 5: Gender equality

16. **The pandemic had a very clear differentiated gender impact – the decline in progress towards gender equality and the empowerment of women and girls is particularly worrying because of the considerable and additive effects that COVID-19 has had on women.** These effects include: an increased exposure to the virus due to the predominance of women as healthcare workers globally; an increased burden of caregiving for family and community members; a rise in gender-based violence as a result of some stay-at-home policies; worsened maternal mortality outcomes as sexual health and reproductive health services are closed or overburdened; and an upsurge in girls entering into child marriages as schools are closed[21].

17. **Women's contribution to the development of society is crucial. For instance, women's contribution medical research and innovation during the COVID-19 crisis has been remarkable and led to striking advancements even though women represent less than a third of all researchers globally and that health-related research led by women is consistently underfunded.**[22] In addition, since the outbreak of the pandemic, there has been a decline in the relative proportion of women posting preprints and submitting research projects, which may put their career advancement or continued employment at risk. In response to that, a number of international scientific organizations established a [Standing Committee for Gender Equality in](#)

---

[20] https://www.foggs.org/covidea/
[21] UN Women. 2020. From insights to action: Gender equality in the wake of COVID-19. URI: http://hdl.handle.net/20.500.12389/22632
[22] Ibid.

Science (SCGES) in September 2020 with the aim of advancing gender equality in science and supporting women whose research careers are being jeopardized by the pandemic.[23]

18. **The global community will fail to achieve SDG 5 unless progress is accelerated; according to data available to date only 1 of the 18 indicators is on track to be met.[24] In addition, there is insufficient data available to understand the full effect of the COVID-19 pandemic, which might be more acute than currently assessed**. Public policies are needed to reduce the burden of unpaid care that falls upon women. This will be critical to ensure the broader engagement of women in economic and social life. Examples of policies needed include the change of work schedules for women; and the development and implementation of family-friendly policies (i.e., parental leave). In addition, there is a strong need for mechanisms that enable families to support adolescent girls to feel safe, to access safe schooling and have access to support. The 2nd UNESCO Engineering Report highlights the crucial role of engineering in achieving each of the 17 SDGs. It shows how equal opportunities for all is key to ensuring an inclusive and gender balanced profession that can better respond to the shortage of engineers for implementing the SDGs.[25]

SDG 14: Life below water

19. **The Ocean has a central role in the Earth's climate system, in maintaining ecosystems and biodiversity and in supporting human systems. The "Blue Economy" is estimated to have an asset base of over US$24 trillion and generates at least US$2.5 trillion each year from the activities such as fishing and aquaculture, shipping and tourism, among others.[26]** Nevertheless, the ocean is currently under serious threat with climate change increasing sea levels and making the ocean warmer, more acidic and depleted in oxygen, compounded by the catastrophic impacts of overfishing, biodiversity decline and pollution from land. These changes in the ocean ecosystems erode its capacity to provide services to the planet and people as well as to regulate the climate and are expected to far exceed the consequences of the pandemic in terms of social and economic costs.

20. **The impact of the systemic risk of COVID-19 also highlights the urgent need to better understand systemic risks to our ocean, and to prepare responses to future crises which threaten the stability of our climate.** The COVID-19 pandemic is a stark reminder of what can happen if there is insufficient awareness of risk, or if available information on risk is not applied and appropriately reflected in planning at all levels of governance. The ocean science community must therefore learn from insights emerging from the pandemic as a systemic event to develop understanding and mechanisms to address future risks to the ocean.[27] Protecting and revitalizing

---

[23] Standing Up for Gender Equality in Science in times of COVID-19: https://council.science/current/news/standing-for-gender-equality-in-science-in-times-of-covid-19/

[24] UN Women Headquarters. 2021. Progress on the Sustainable Development Goals: The gender snapshot 2021. https://tinyurl.com/uemsp62a

[25] UNESCO. 2021. Engineering for Sustainable Development: Delivering on the Sustainable Development Goals

[26] OECD. (2016). *The Ocean Economy in 2030.* Paris: Organisation for Economic Co-operation and Development (OECD). https://doi.org/10.1787/9789264251724-en

[27] Murphy EJ, Robinson C, Hobday AJ, Newton A, Glaser M, Evans K, Dickey-Collas M, Brodie S and Gehlen M (2021) The Global Pandemic Has Shown We Need an Action Plan for the Ocean. *Front. Mar. Sci*. 8:760731. https://doi.org/10.3389/fmars.2021.760731

HIGH-LEVEL POLITICAL FORUM
ON SUSTAINABLE DEVELOPMENT

International
Science Council

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

the ocean require collective action and holistic approaches[28]; a healthy ocean could, if at least 30% of it is protected effectively, deliver 20% of the carbon emission reductions needed to achieve the Paris Agreement's 1.5°C goal; 40 times more renewable energy than was generated in 2018[29]; 12 million jobs; and US$15.5 trillion in net economic benefits.[30]

21. **The STC Major Group welcomes the powerful commitments made by governments, representatives of civil society and industry at the One Ocean Summit to stop the degradation of the ocean**. These include protecting the world's biodiversity and ocean resources, joining forces to cope with climate change, and ending plastic pollution. The UN Ocean Conference in Lisbon, in June, and COP27 in Egypt, this November, should be used as platforms to further advance these commitments and strengthen collective action for the ocean. In addition, the UN Decade of Ocean Science for Sustainable Development 2021-2030 is a key opportunity to minimize change in ocean systems and negative impacts on the contributions that ocean systems provide to society through deep disciplinary understanding of ocean processes and solution-oriented research to generate new knowledge.

22. **Political efforts will not be sufficient unless they are complemented by commitments from the business sector, whose interests are currently at stake given the immense transformation required to lessen the environmental impact of industry.** While the shipping industry is central to fuelling the global economy, it is also a huge polluter and the shift to a carbon-free system would not necessarily be without hurdles, including significant financial implications.

23. **Progress to date on the international political scene remains insufficient and is happening slowly when compared to the breadth of change required to counter current unsustainable trends and support a healthy ocean.** Progress is required in four important areas[31]:

   ● Governments throughout the world need to agree on legally binding agreements and set targets to support the development of clear goals for the ocean and provide a benchmark against which progress can be measured.
   ● Governments must seriously engage in sustained ocean observation and data sharing to support ocean predictions and assessments of the state of the ocean, as well as data driven decision-making.
   ● Private sector, civil society actors and other ocean stakeholders need to be brought together and mobilized to deliver on a set of shared goals through the development of new multi-stakeholder partnerships.
   ● The marine scientific community still needs to develop robust understanding of specific elements of ocean science to be able to spring into action. In this regard, the work of the research community on new initiatives such as the development of digital twins (representations) of the ocean that will facilitate the evaluation of specific interventions to better understand the extent of their potential impacts, as well as costs and benefits, before deployment is very important.

[28] Lubchenco, Jane & Haugan, Peter & Pangestu, Mari. (2020). Five priorities for a sustainable ocean economy. *Nature*. 588. 30-32. https://doi.org/10.1038/d41586-020-03303-3.
[29] https://www.oceanpanel.org/climate?utm_medium=affiliate&utm_source=nature&utm_campaign=specialreports
[30] https://www.oceanpanel.org/Economicanalysis?utm_medium=affiliate&utm_source=nature&utm_campaign=specialreports
[31] https://council.science/current/blog/high-time-for-action-protect-oceans/

HIGH-LEVEL POLITICAL FORUM
ON SUSTAINABLE DEVELOPMENT

International
Science Council

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs

SDG 15: Life on land

24. **Despite a growing and shared concern about the convergence of environmental tipping points, environmental degradation is accelerating[32].** Our global biodiversity is declining at alarming and unprecedented rates. Most indicators of the state of nature are declining, which has weakened nature's capacity to provide vital benefits that are indispensable for humanity's well-being and prosperity.[33] In addition, recent data reveals the extent of human activity's impact on living nature: at least 70% of land surface has been altered; 1 million species of animals and plants are threatened with extinction; and forests span only 68% of their preindustrial size. The unprecedented mobilization of governments to respond to COVID-19 does not appear to have greatly served the cause of sustainability, despite repeated pledges on creating a green and sustainable recovery[34].

25. **Attempts to accelerate economic recovery by relaxing environmental and climate change regulations would worsen biodiversity loss and climate change, making climate change scenarios increasingly negative. Further loss and destruction of biodiversity and ecosystems will undermine society's chances of achieving the SDGs as well as the Paris Agreement on climate change.** In addition to nature's role in providing food, water and livelihoods for people, protecting, restoring and sustainably managing natural ecosystems, such as old-growth forests, marshes, mangroves and peatlands, could account for at least 30% of global action needed to avoid the worst climate scenarios[35]. Investing in biodiversity as part of the COVID-19 policy response can help minimize the risks that biodiversity decline poses to human well-being, while also reducing the risk of future crises and improving the resilience, health and long-term viability of businesses and the economy.

26. **The COVID-19 pandemic risks derailing progress on the sustainability agenda threaten to create more environmental and biological risks.** Adoption of the One Health approach[36] in countries across the globe could help prioritize examination of the inseparable interconnection between animals, humans and the environment. In addition, the root causes that allowed for the emergence of the COVID-19 virus need to be tackled by investing in conserving tropical forests and in forest restoration, banning wildlife trade, ceasing encroachment on tropical natural habitats and increasing protected areas. In addition, prevention capabilities need to be strengthened by investing in research to close critical knowledge gaps and in disaster risk reduction and risk governance, creating stringent biosecurity rules, and regulations in agriculture and animal health, strengthening COVAX or a COVAX-type institution to better deal with potential future pathogens.

27. **Long-term recovery from COVID-19 must include the restoration of ecosystems and a transformation of our relationship to nature in ways that are just and sustainable.** Nature is deeply intertwined with and influenced by social, economic, and political forces; nuanced understandings of dynamic people-nature relationships are crucial to inform restoration activities that can support positive ecological outcomes alongside social well-being. Scientific

---

[32] Reflections on sustainability. *Nat Sustain* **4,** 921 (2021). https://doi.org/10.1038/s41893-021-00821-4

[33] IPBES. 2019. Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Brondizio, E.S., Settele, J., Díaz, S. and Ngo, H.T. (eds). IPBES Secretariat, Bonn, Germany.

[34] Strand, Roger & Kovacic, Zora & Funtowicz, S. & Benini, Lorenzo & Jesus, Ana. (2022). COVID-19: lessons for sustainability?. https://doi.org/10.2800/289185

[35] https://www.conservation.org/events/biodiversity-negotiations

[36] https://www.fao.org/one-health/en

research on the dynamic and multi-faceted people-nature relationships should be placed at the centre of decision- and policy-making.[37] Policy commitments are a strength; strategies for meaningful devolution to the scale of ecological communities and livelihood systems needs to be enriched, guided by multiple stakeholder perspectives, science and experience.

SDG 17: Means of implementation and partnerships for sustainable development

28. **With the pandemic still unfolding and extreme weather- and climate-related events increasing, a much stronger and more nimble partnership between science, engineering, policy and practitioners is required to address rapidly evolving situations with multiple drivers and varied impacts at national and local scales**. The Institution of Engineers Mauritius released a book on the role of engineering in addressing climate change in the Small Island Developing States**.**

29. **The pandemic revealed that despite decades of economic growth globally and enormous strides in science, science systems need to be strengthened to be able to generate solutions to tackle complex challenges and the knowledge necessary to support and steer transformational changes towards a sustainable and equitable world.** The COVID-19 pandemic has put science under the spotlight and has stimulated strong public interest in and enthusiasm for science.[38] Scientific communities have been mobilized by governments worldwide to generate insights on a wide range of issues and to shape response strategies that would take account of the multidimensional nature of the crisis. However, the pandemic also revealed deficiencies in the scientific research environment related to the capacity of science systems to respond to new priorities in a timely manner, while limiting disruption to ongoing research. Perennial issues of persistent inequalities in science[39] and limitations of the current system of publication and peer-review were also brought to the fore.[40]

30. **COVID-19 recovery packages should enable science to achieve its full potential and to generate new knowledge on which system-change transformations can be grounded, as well as seek to transform and strengthen science and science systems to be more inclusive, accessible, reliable and open.** Access to high-quality, robust and relevant scientific knowledge from the full range of disciplines, including health sciences, natural and social sciences, and the humanities, is essential in these pressing times when creative, rapid and critical decisions need to be made. A truly transformative and successful COVID-19 recovery that will shift the world onto a sustainable path must be informed by scientific knowledge and solutions that are co-designed and co-developed with various stakeholders from business, policy-makers, civil society and indigenous people, among others. The ability of governments to leverage the power of science

---

[37] ISC President Statement for the Special Session to commemorate the 50th Anniversary of the UN Environment Programme:
https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/38659/Peter%20Gluckman%20ISC%20UNEP%4050%20statement.pdf?sequence=1&isAllowed=y

[38] The Lancet. 2020. Editorial – Science during COVID-19: where do we go from here? The Lancet 396(10267), 1941. https://doi.org/10.1016/S0140-6736(20)32709-4

[39] Myers, K.R., Tham, W.Y., Yin, Y. et al. 2020. Unequal effects of the COVID-19 pandemic on scientists. Nature Human Behaviour 4**,** 880–883. DOI:https://doi.org/10.1038/s41562-020-0921-y

[40] Rovenskaya, E., Kaplan, D. and Sizov, S. 2021. Strengthening Science Systems. Thematic Report. In: Transformations within reach: Pathways to a sustainable and resilient world. IIASA-ISC.

in support of a better COVID-19 socio-economic recovery and a more equitable, healthy and sustainable future will be crucial.

31. **With less than 10 years until 2030, it is time for an urgent reflection on how science is developed and applied to the global commons. Current linear approaches to addressing the underlying challenges of the global commons are not effective**. **The existing science system composed of the agendas of different disciplines cannot solve current existential challenges and cannot address national issues either.**[41] The pandemic and the different environmental challenges demonstrate that national interests are best served by more global and connected approaches to the delivery of science, while it is also important to support science specific to a country context. The lack of a mechanism to identify the key priorities and actions by which science can address the urgent issues of sustainability in a coordinated way is a great issue that needs to be urgently addressed. There is an obvious gap that needs new approaches, new funding and new mechanisms.

32. **There is a need to identify the issues where a collective scientific and engineering approach is urgently needed to determine the knowledge barriers to sustainability and to collectively support work of that kind through a mission-led approach.** The ISC has recently launched a Global Commission on Science Missions for Sustainability, which makes the compelling case for stepping out of our business-as-usual approaches towards structuring science, funding science and doing science. Its mission is to identify the most appropriate institutional arrangements and funding mechanisms required to co-construct and co-deliver on five Science Missions for Sustainability in critical areas of food, energy and climate, health and wellbeing, water and urban areas as outlined in the ISC's report Unleashing Science: Delivering Missions for Sustainability. Similarly, the World Federation of Engineering Organizations has "A plan to advance the achievement of the UN SDGs through Engineering", which is serving as the roadmap for the organization and the 30 plus million engineers it represents globally.

33. **Employing new approaches to doing science, such as transdisciplinary research and promoting a systems-based approach, will be essential to address today's sustainability challenges and accelerate transformations.** Transdisciplinary research is the only way to make real progress on the sustainability agenda as it allows us to better understand the multiple underlying drivers, interdependencies and complexities of the current global challenges**.** This new way of thinking and doing research means framing research questions through multiple lenses, engaging those tasked with framing the questions and other stakeholders from the outset. A joint conference of the Royal Academy of Engineers (RAEng) and CESAER highlighted key technologies expected to evolve over the next 30 years for enhancing learning, teaching and capacity building generally.

34. **The pandemic highlighted the importance of information sharing and the aims of the open science movement to make the scientific process more transparent, inclusive and democratic.** Open Science is crucial to increase the capacity of science to understand and tackle complex and urgent issues, while a widespread dissemination of existing and emerging scientific knowledge and breakthrough tools, approaches and solutions is key to fully revealing their transformational potential.[42] In keeping with implementation of UNESCO's Recommendation on Open Science,

---

[41] International Network for Government Science Advice. 2021. Peter Gluckman, Opening Address to the Global Forum of Funders 2021. https://www.ingsa.org/ingsa-news/pdg-funders-forum-21/

[42] ISC and WFEO. 2020. Scientific and Technological Community Major Group position paper on the theme of the 2020 High-level Political Forum. Accelerated action and transformative pathways: realizing the decade of

Member States, research institutions and funders should work together to accelerate the transition to inclusive open access and open science based on community-owned infrastructures, recognizing their potential to facilitate interdisciplinary research, support the science–society and science–policy interface, and so deliver on the SDGs. However, open science has a cost that must be met, and further progress on the ongoing evolution of science publishing to support open access is needed[43]. There is growing concern for instance, that low-income countries, less wealthy universities, and young scientists or those from minoritized communities are discriminated against in the current approach to open science.

35. **Global efforts are urgently needed in capacity-building for global science and engineering leadership for the next generation.** COVID-19 has impacted young scientists particularly harshly, potentially leading to a lost generation of scholars.[44] Young scientists must be better supported to both engage in research and become active at the science–society–policy interface. The ISC recognizes the many challenges early-career scientists and young academies face in navigating and evolving complex science systems. In response to those challenges, the Council recently announced that it would prioritize the development of stronger collaborations with young academies and associations as a way of more actively engaging these networks in international science organizations[45]. The World Federation of Engineering Organizations Academy organized by its committee on Education in Engineering, International Engineering Alliance (IEA), Federation of Engineering Education Societies (IFEES) and Global Engineering Deans Council (GEDC) is set to provide training and build capacity through accreditation bodies, educators and individual engineers.

---

action and delivery for sustainable development. May 2020. https://council.science/wp-content/uploads/2020/06/Position-Paper-STC-29-June.pdf

[43] International Science Council. 2021. Opening the record of science: making scholarly publishing work for science in the digital era. Paris, International Science Council. https://doi.org/10.24948/2021.01h

[44] IAP-GYA Joint Communiqué. 2021. COVID-19 threatens to lead to a 'lost generation' of researchers. https://globalyoungacademy.net/covid-19-threatens-to-lead-to-a-lost-generation-of-researchers-iap-and-gya-issue-joint-communique/

[45] https://council.science/current/blog/an-invitation-for-eligible-young-academies/

SCIENTIFIC AND TECHNOLOGICAL COMMUNITY

We seek to secure a mandate for science at the United Nations (UN) and integrate science in major global policy processes, such as the implementation and monitoring of the 2030 Agenda and its Sustainable Development Goals (SDGs).

ORGANIZING PARTNERS

International Science Council (ISC)
https://council.science/

World Federation of Engineering Organizations (WFEO)
http://www.wfeo.org