

Fourth annual Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs
New York, 14 – 15 May 2019

Meeting Summary for side event “Earth and Environmental Science Education for Sustainable Development”

Conference Room 12, New York, **15 May 2019, 08:00-09:30**

1. **Objective of the side event (1 para):** This side event explored the role of strengthened Earth and environmental science education in helping to achieve diverse SDGs. We explored the following questions: (i) How does enhanced public understanding of environmental processes and resources help to empower communities and advance progress towards the SDGs?; (ii) What practical and innovative ways exist to enhance public understanding of environmental processes and resources, through formal and informal education, citizen science, technologies, and place-based learning? And (iii) What measures could strengthen environmental science capacity and institutions (particularly in the Global South), and the ability for the global environmental science community to contribute to the SDGs?

2. Organizers & Participation

Lead Organiser: Geology for Global Development (www.gfgd.org). Geology for Global Development (GfGD) is a not-for-profit organisation (registered in the UK), established to champion the role of geology in sustainable development, mobilising and equipping the geology community to support the SDGs

Organising Partners: United Nations Major Group for Children and Youth, International Science Council (ISC), UNESCO/IUGS International Geoscience Programme (IGCP 685), International Union of Geological Sciences, British Geological Survey, Sustainable Earth Institute, University of Plymouth, Water Youth Network, Parsquake, Young Earth System Scientists Community, Red Latinoamericana de Ciencias Atmosféricas y Meteorología

Speakers:

- Lucilla Spini (Senior Science and Policy Officer, International Science Council)
- Aparna Joshi (Indian Institute of Science Education and Research):
- Solmaz Mohadjer (Founder and Director, Parsquake):
- Jackie Ratner (National Center for Disaster Preparedness, Earth Institute, Columbia University)
- Palmira Cuéllar (Young Earth System Scientists Community, Mexico)

Moderator: Joel C. Gill (Executive Director, Geology for Global Development)

3. Major issues discussed in the session (in bullet form)

- **Environmental challenges (e.g., climate change) are inherently interdisciplinary, and can be introduced in different parts of the curricula to help improve grassroots engagement in sustainable development.** This is demonstrated by the work of TROP-ICSU (<https://tropicsu.org/>), aiming to integrate relevant education and science communication modules in the education system to help future citizens across the globe in improving their understanding of the science of climate change and in developing necessary skills to mitigate its impact.

- **Indigenous and traditional knowledge can enrich our understanding of environmental hazards and change, critical to effective climate change action and disaster risk reduction.** Listening to community understanding is essential to empowering local communities. Examples were profiled from the work of Parsquake (<http://parsquake.org/>) and STREVA (<http://streva.ac.uk/>).
- **'Paired Teaching' resources can help to bring Earth science expertise into classrooms of marginalised, under-resourced, or remote communities.** Excellent examples for disaster risk reduction were presented by Parsquake (<https://www.youtube.com/channel/UCoNs-jxUx1wUQfVhKI0ZZCQ>).
- **Citizen science and technology can be critical to increasing Earth and environmental science understanding.** Examples included 'paired teaching' videos (see above) and using structure-from-motion photogrammetry techniques to generate digital terrain models from crowd-sourced imagery, providing an alternative to costlier options such as LiDAR or satellite surveys (<https://journals.sagepub.com/doi/abs/10.1177/0309133318823622?journalCode=ppga>).
- **Formal and informal networks and academies provide a forum to empower young scientists, foster dialogue across disciplines, and strengthen communities of practice in the Global South.** An example is the Young Earth System Scientists Community (<https://www.yess-community.org/>).

4. Main outcome

The primary outcome of this meeting was facilitating links between civil society groups, public sector organisations, and the scientific community working on environmental education. There was strong agreement that better understanding the natural environment is critical to achieving the SDGs, and that this include both public understanding of Earth and environmental science and enhancing professional communities of Earth and environmental scientists. A primary follow up action is to strengthen links between the Earth science community and the Major Group on Science and Technology.

5. Key recommendations for action (in bullet form)

- **Earth science education should be better incorporated into formal education curricula.** The International Geoscience Education Organisation (IGEO) and the International Union of Geological Sciences Commission on Geoscience Education (IUGS-COGE) set out a potential syllabus, available here: www.igeosci.org/activities/international-geoscience-syllabus/.
- **Environmental institutions in the Global South should be better resourced to enhance their collection, management, and integration of environmental data** (e.g., relating to water, soils, geology, meteorology). Evidence indicating this as being a locally expressed priority, and helping to strengthen policy coherence to reduce environmental degradation can be found here: <https://www.sciencedirect.com/science/article/pii/S2211464518302641>
- **An analysis of any future deficit of Earth and environmental professionals, disaggregated by region and sector, is needed to ensure sufficient environmental expertise to help deliver the SDGs.** For example, the scaling up of so called green technologies (e.g., electric vehicles) require natural resources and effective systems in place to minimise environmental pollution throughout their life cycle. This will inform subsequent actions, around undergraduate, postgraduate and technical training.
- **Developing professional Earth and environmental science networks (e.g., learned societies, academies) in the Global South can help improve policy-maker access to Earth science information.**