

WATER AND SUSTAINABLE DEVELOPMENT

'Meeting the needs of the poorest while maintaining health ecosystems'

6th GfGD Annual Conference - Friday 2nd November 2018 – Event Report

Understanding, managing and protecting water resources is critical to the delivery of the UN Sustainable Development Goals (e.g., education, water and sanitation, healthy oceans, zero hunger, good health, gender equality, energy, industry, and biodiversity). Increasing urbanisation, industrialisation, and climate change, however, are increasing pressure on water supplies and reducing water quality. This conference explored the role of geoscientists in managing conflicting demands for water, ensuring that the needs of the poorest are met while enhancing the health of ecosystems.

Water and Sustainable Development

Robert Kalin, [Professor of Environmental Engineering for Sustainability at the University of Strathclyde](#), gave the keynote lecture at the GfGD conference, giving useful context for the day and reflecting on his team's research in sub-Saharan Africa. You can find a recording of a similar talk to the one given at the GfGD conference on YouTube – presented at a TedX event: www.youtube.com/watch?v=G5awly3U7pA.

Read about work being done to bring clean water to Malawi: www.strath.ac.uk/whystrathclyde/news/cleanwaterforallinmalawi/

The University of Strathclyde offer an MSc hydrogeology course with the potential to do a research project in Malawi: www.strath.ac.uk/courses/postgraduatetaught/hydrogeology

Conflicting Demands - Integrated Water Management

Urbanisation, industrialisation, and climate change are all increasing the pressure on water supplies and water quality. This session explored how integrated water management, stakeholder dialogue and coherent policies can help to protect water supplies and ensure equitable access to advance economic and social development, meeting the needs of the poorest in society and fostering healthy, diverse ecosystems.

- **Large Numbers of Stakeholders:** Giving voices to all stakeholders in management discussions is key to effective, fair and sustainable future management of water resources, but challenging due to lots of invested and interested parties with differing priorities, power and education levels.
- **Catchment-Based Water Management and Shared Risk:** Partnership and collaboration of all local stakeholders and sharing of associated risks is important in managing water resources. Building and maintaining successful partnerships is challenging. A third-party body to listen to and balance the views of all parties may be a possible solution.
- **Policy Enforcement:** Legislation needs to be enforced for water management policy to be effective. In some contexts, achieving this is challenging due to many demands on industry and government. Better policies are needed around wastewater, viewing it as a resource, and moving to a circular economy. Policies should prioritise using the lowest quality water that is fit for the selected purpose, to help protect higher quality resources.
- **Transnational Aquifers:** Increasing dependency on groundwater resources brings into question the legal implications for the division of cross-border groundwater resources. Legal division of these resources is challenging

due to limited, and a lack of precedent in the management of such resources

Further Reading:

- ODI Briefing Paper - 10 things to know about the future of water and sanitation: www.odi.org/publications/10886-10-things-know-about-future-water-and-sanitation
- ICMM water stewardship position statement: www.icmm.com/water-stewardship-framework
- ICMM members mandatory commitments to water stewardship: www.icmm.com/water-ps
- ICMM guidance on a catchment-based approach to water management: www.icmm.com/guide-to-catchment-based-water-management
- ICMM case studies on collective action on water stewardship: www.icmm.com/shared-water-shared-responsibility
- ICMM water reporting standard and guidance for the mining industry to support harmonised, consistent water reporting to equip decision makers with better data on how mining used and manages water: www.icmm.com/en-gb/environment/water/water-reporting
- IPIECA Good Practice for Water Management Reports: www.ipieca.org/our-work/environment/water-management/good-practice-for-water-management/



Pollution – Pathways, Impacts, Solutions

Urbanisation, environmental change and industrial activity can result in poor water quality; this is particularly problematic in developing countries. Poor water quality can lead to spread of disease and health impacts associated with consuming contaminated water. Solutions such as changing methods of water and waste collection and implementing policy to

promote better industrial practise can improve water quality, thereby promoting better human and environmental health.

- **Salinisation of Groundwater:** This is an often hidden health consequence of environmental change, for example, causing increased rates of preeclampsia and hypertension in pregnant women. Saline groundwater is prevalent in low-lying coastal areas such as Bangladesh, which are susceptible to sea level rise, with salinization of groundwater exacerbated by local land use. Alternative water sources such as rainwater harvesting can help combat domestic consumption of saline water. Read more: <https://ehp.niehs.nih.gov/doi/10.1289/EHP659>
- **Arsenic Pollution of Water Sources:** A significant proportion of groundwater resources in Bangladesh are contaminated with arsenic. Contamination of water resources by arsenic has risen with increased utilisation of deep groundwater resources. Modelling of groundwater flow pathways, and mapping of groundwater resources can lead to improved understanding of groundwater arsenic pollution, and the controls on it. Read more: <https://link.springer.com/article/10.1007%2Fs40899-018-0275-z>
- **Waste and its Impact on Water Quality:** Urbanisation and increasing consumerism is increasing the amount of waste produced in developing countries, in particular plastic waste. Poor waste management results in large amounts of litter blocking drains, creating stagnant water bodies, which increases the risk of water borne diseases e.g. cholera. Effective waste management is key to good water quality and the reduction of water borne disease transmission in developing countries. Download a *Making Waste Work* toolkit for community waste management in lower- and middle-income countries: <https://wasteaid.org.uk/toolkit/>
- **Industrial Processes and Groundwater Contamination:** Groundwater can become polluted through industrial activities and processing. Implementing measures in pre-processing, treatment and post-processing stages of industry can help ensure water contamination from industry is minimised. Industry representatives suggested that education not legislation is key to achieving this. Read more about the Geological Society's Contaminated Land Group: www.geolsoc.org.uk/contamland

Water and Sustainable Development in Tanzania

In the morning Benedicto Hosea introduced his work in Tanzania, helping to improve access to improved water resources in rural Tanzania. Learn more about Benedicto's work, with this presentation given to the All Party Parliamentary Group on Tanzania in the Houses of Parliament: www.slideshare.net/jachapman82/youth-employment-and-entrepreneurship-in-tanzania-benedicto-hosea-at-uk-all-party-parliamentary-group-tanzania-october-2018

A later session explored the work of The Eleanor Foundation (EF), delivering water and sanitation projects to support sustainable development in the Biharamulo and Chato districts of NW Tanzania. This interview discussed four key themes, with lessons relevant to other international development projects:

- **Partnerships:** EF work closely with the district government water engineers, development officers, and health advisers ensuring that their work supports government activities. These partnerships are critical to successful work in the region but have taken time to develop. Relationships have been strengthened through recognition that EF are a long-term partner in the region. EF work through local expertise in Tanzania, with Tanzanian directors and staff. Partnerships with the community are also important, and help to ensure the community 'own' their project.
- **Culture and Context:** Going into the region, it was critical to understand the social, economic, and cultural context, as well as technical issues prior to implementing a water point. This included relevant 'normal practice' regarding community water user groups, and their responsibilities to maintain water points. Working in close partnership with colleagues in Tanzania helped the EF to understand important cultural practices, and how to develop projects that align with the Tanzanian National Water Policy.
- **Holistic Development:** EF are developing systems to improve health care and education in the region, recognising that tackling poverty needs holistic thinking. Access to improved water can help to reduce health problems, improve access to education and improve gender equality. By investing in additional water treatment at schools, sanitation facilities for girls, and health facilities EF are aiming to maximise the impact their water programme will have on rural poverty in the region.
- **Water Quality:** Putting in improved water supplies is only helpful if the water is not contaminated (e.g., by faeces). The EF team give hygiene training to reduce the likelihood of contamination while water is transported and stored. Water quality testing is a challenge, due to limited equipment and government capacity. EF are using low-cost, portable equipment that enables rapid identification of contaminants. This is an area where more investment may be needed.

Further Reading

- The Eleanor Foundation (www.eleanorfoundation.co.uk)
- Hydrogeology of Tanzania (<https://tinyurl.com/HydroTanz>)

Future Work. In 2019, GfGD will be supporting the work of The Eleanor Foundation, helping to deliver SDG 6 in Tanzania. We will be using surplus income from our conference, together with other funds, to facilitate an evaluation of The Eleanor Foundation's water programme. This will generate recommendations for The Eleanor Foundation team to ensure long-term impact and sustainability.



A frequently asked question is ‘*how do I develop a career linked to international aid or sustainable development?*’. While this is a difficult question to answer (there isn’t a straightforward career path/graduate scheme), here are some thoughts and we [highlight](#) details of related GfGD resources and activities.

1. Geoscience matters, is critical to progress towards sustainable development, but is not always recognised. While geoscientists are critical to delivering many aspects of the SDGs, this is not always clear and understood by others engaged in development work. Geoscientists have many relevant skills, and their knowledge of Earth systems means they are well placed to be at the centre of sustainable development decision making, and not on the fringes. [In 2018, we were invited to submit a report to inform the International Commission on Education for Sustainable Development Practice Report](#), highlighting how geoscientists could fill a gap in professionals trained to engage in sustainable development. This report will be published in early 2019, and we are hopeful it will note the role of Earth scientists. [GfGD will use this report as an advocacy tool, highlighting the importance of geoscience.](#)

2. Two pathways, both equally important. We suggest that there are two general pathways to putting sustainable development at the heart of your career. Both are important and can result in exciting opportunities to see positive change.

(i) Work for a traditional geoscience employer (e.g., energy, mining, environmental services, academia, risk modelling, geological surveys), championing the values and ethics we promote. You can devote your career to supporting sustainable development in all the traditional geoscience career routes (academia, industry, public sector), being ambassadors for the values and ethics we promote. For example, championing positive and respectful partnerships that build local science, technology, and innovation capacity, promoting good practice, engaging with geoethics, and taking part in capacity building. [Our 2017 papers on ‘Geology and the SDGs’ and ‘Geoscience Engagement in Global Development Frameworks’ \(both open access\)](#) give examples of how engaging in traditional geoscience sectors can help deliver the SDGs.

(ii) Work for a non-traditional geoscience employer (e.g., NGOs, DFID, development think tanks), but be prepared to invest in additional skills and knowledge to serve effectively in these roles. There are few jobs in the development sector for those with a pure geoscience background but combine your environmental understanding with further expertise in logistics, policy, communications, social vulnerability etc, and you could be an attractive candidate. While geoscience will inform and strengthen you in such roles, it is unlikely that your tasks will involve the day-to-day application of geoscience. See #4 and #5 for tips as to how to do this.

3. Be in it for the long-term. Getting to where you want to be may take time and involve a winding path. Think strategically about what postgraduate courses may suit your future career plans. For example, ask if there are options to do your dissertation overseas, take modules from other departments, or do placements with those working in development contexts

(so you build your network of contacts, see #6). Partnerships with those in the Global South can also take time to develop. Build trust and prove that you treat partners with respect. If bringing a development aspect to your work, recognise that it can take time to develop and mature meaningful partnerships.

4. Invest in new skills and ways of working. The skills required to make an effective and positive contribution to sustainable development are often missing from the traditional education and continued professional development of geologists. Examples include communicating across cultures and disciplines, diplomacy, community mobilisation, social science research methods (e.g., what makes a good semi-structured interview, and how can that data enrich your understanding of water resources or hazard impact). Demonstrating an understanding of why these are important in development contexts, and some competence in these skills, may help to boost your employability in some roles. [In 2016, GfGD published a paper on ‘Building Good Foundations – Skills for Effective Engagement in International Development’ that outlines these skills.](#) Email info@gfgd.org for a PDF copy. We have also organised skills training at major international events in the Tanzania and South Africa.



5. Read widely around development challenges (dipping into other disciplines). Development challenges (e.g., access to water, food security, energy poverty, climate change, disaster risk reduction, urbanisation) are rarely solved by one discipline. We get a good understanding of technical geoscience in our degrees but miss out on opportunities to interact with and learn from other disciplines (e.g., engineers, geographers, social scientists, health professionals). Careers outside of the traditional geoscience industries will require you to demonstrate a broader understanding of sustainable development than just the contribution of geoscience. [This is a reason GfGD conferences are interdisciplinary with speakers from economics, social sciences, engineering, and public policy.](#) There are texts relating to disaster risk reduction, water management, natural resources, climate change and urban development that will present new ideas from human geography or the social sciences. If another department includes modules on relevant development challenges, but from different perspectives, email and ask for a reading list and start to broaden your understanding.

6. Network, Network, Network. Use any opportunity you can to network – including in person and through appropriate use of social media (e.g., Twitter). The latter can be a good way to find jobs and learning materials and introduce yourself to people in development. Keep online accounts professional and active. Look out for free events and talks at and outside of

universities. Organisations such as ODI have free events where you can attend in person or remotely via a webinar. GfGD have previously facilitated networking meetings, arranged placements, and provided conference bursaries and hope to develop further opportunities in 2019.

Conference Feedback – Summary and Responses

Approximately 115 people attended the conference, and 72 feedback forms were received. 97% of those submitting feedback forms found the meeting to be a very or fairly positive experience, and the remaining 3% found it to be a slightly positive experience. People enjoyed:

- Speaker diversity, including from industry, civil society, academia, and politics, and from many different disciplines.
- Lord Duncan's talk was well received.
- Perspectives from Tanzania, both from Benedicto Hosea and The Eleanor Foundation.
- The friendly and welcoming atmosphere.
- Talks on solid waste management (Mike Webster, WasteAid) and Contaminated Land (Paul Nathanail, LQM Ltd).

Some specific questions/comments were:

[1] Could we have more guidance on careers in geoscience-for-development? *See above!*

[2] The UN activity needed more time and clearer instructions. *We agree! We like to include an activity in the afternoon that gets people interacting and wanted to share our experiences of engaging with the UN. In future we will try*

and leave more time for this type of activity, and ensure the instructions are clearer and provided in a printed format.

[3] We'd like more time for questions and discussion. *Great – we like our events to be as interactive as possible, with everybody having the chance to share their ideas and ask questions. We will try and fit a little less into the programme next time to leave longer for questions from the audience.*

[4] Can the conference include more industry participants? *The best way to get more participants from industry is for you all to invite colleagues, promote the event to your contacts, and help us to spread the word! We work hard to get industry speakers, and always welcome industry participants (keeping our registration costs much lower than comparable events).*

[5] Can you provide printed conference programmes? *We think it's important to minimise the environmental impact of our events. We print copies of the 1-page schedule and make these available but have always refrained from printing the 15-page conference booklet for all 100-150 participants.*



GEOLOGY FOR GLOBAL DEVELOPMENT

Geology for Global Development (GfGD) is a registered charity championing the role of geology in sustainable development, and mobilising and reshaping the geology community to help deliver the UN Sustainable Development Goals. Find out more about our work online (www.gfgd.org), and how you can support us (www.gfgd.org/donate). Get information about future events, news, and opportunities by following us on Facebook (www.facebook.com/gfgd.org) or Twitter ([@Geo_Dev](https://twitter.com/Geo_Dev)).



Get Involved

1. **Promote our work.** We value your help in raising awareness of Geology for Global Development's vision, activities, and opportunities to get involved. For example, your colleagues may wish to attend our conferences, coordinate a fundraising event or use their skills as part of our team.
2. **Strengthen the oversight of our work.** We are currently seeking committed professionals to join our Board of Trustees, particularly those who have experience in fundraising, international development, charity reporting, or human resources. Find out more at the bottom of this page: www.gfgd.org/team
3. **Donate to our work.** We would love to partner with those who share our vision and values. Your donations will enable us to fund conference bursaries, commission research to strengthen development practice of small NGOs and geoscience agencies in low-income countries, coordinate workshops and training events, build partnerships with key UN and development agencies, and produce resources to equip the geoscience community.
4. **Inform our work.** We would love to start a dialogue focused on the ideas and insights you and colleagues have that may enrich the work we are doing. We are often looking for speakers at our annual conference, and for seminars in universities.
5. **Help deliver our work.** We will be sharing a range of ways to volunteer and get involved in GfGD activities in 2019. This will include short term tasks relating to specific projects, and longer-term roles as part of our executive team. Follow our social media for more information.