communications earth & environment

EDITORIAL

https://doi.org/10.1038/s43247-023-01150-4 OPEN

Effective climate adaptation must be imaginative and inclusive

The lived experiences of the full diversity of people facing climate change must be taken into account for climate adaptation to be effective and to avoid maladaptation.

Adaptation to climate change is tricky, especially when the impacts and challenges facing communities around the world are so diverse. Discussions between researchers, practitioners, indigenous communities and policy makers at the Adaptation Futures conference held in Montreal, Quebec, from October 2-6, 2023 (https://adaptationfutures.com/) made it clear that a change in mindset is required. We must acknowledge the different needs of the populations and embrace the diversity of approaches to achieve effective adaptation. Only by strengthening inter-cultural and cross-sector collaborations will we be able to implement solutions that profoundly transform societies and infrastructures.

Self-transformation and climate justice are key in adaptation. Right in the first plenary speech, Sheila Watt-Cloutiere, an Inuit environmentalist and Citizen Advocate on Environmental, Cultural and Human Rights at Siila- Simply Independent, Canada, laid the groundwork for successful and effective climate adaptation. She called for more imagination, empathy and personal transformation in adaptation and emphasised the need to innovate ourselves. The three keywords 'inclusivity', 'innovation' and 'imagination' resonated across all sessions of the conference.

At numerous panels, indigenous communities from North and South America expressed great concerns about the increasing disregard for indigenous voices in the development of local solutions. Because indigenous and western knowledge are complementary, in combination they can create a shared worldview that helps avoid maladaptation. Yet indigenous knowledge is not adequately recognized in climate action assessments and policies[1]. New ideas for adaptation, for example coming from Indigenous arts, must be pursued. But forums and structures where knowledge is co-created in an inclusive and equitable manner including all forms of expression are lacking.

The need to listen to young people was stressed by Ayesha Constable, climate researcher and practitioner, GirlsCARE and Young People for Action on Climate Change, Jamaica. She emphasised that young women in particular are key to finding creative solutions. Intergenerational learning and knowledge transfer tend to be underestimated in current climate adaptation research. To better appreciate the power of the next generation in climate action and understand how new practices reduce the risks communities face[2], it can help to involve a diverse community of environmental and social scientists, local indigenous communities and citizens of different generations.

In some regions, despite the urge to act, populations are not only vulnerable to climate change, but also to local and regional conflicts. Elisa Benevelli from the non-governmental organisation DanChurchAid who works in Mali and the Sahel, discussed the compound vulnerabilities from climate change and conflicts. Causal links remain unclear, which makes adaptation solutions in these countries difficult to find and implement. The lack of resilience of populations worsen food insecurity and competition for resources, an increase in civil unrest and tensions and, ultimately cause mass displacements. Addressing the root causes of conflicts and understanding human histories, migration and population displacement due to climate change and conflict dynamics is essential to developing adequate sustainable solutions.

In the digital age, solutions can be found through innovation. The lack of easily accessible knowledge can prevent practitioners from developing suitable and actionable solutions based on science. Chat Climate (https://www.chatclimate.ai/), a large language model trained on the results from the latest reports of the Intergovernmental Panel on Climate Change (IPCC), was built specifically to help people find the information they need to develop solutions

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in their individual sectors, reported Markus Leipold, University of Zurich, Switzerland, and it does so more accurately than a Large Language model not specifically trained on the IPCC reports[3]. Climate-smart agriculture that includes machine learning tools was also proposed as a way to help guide actions to transform agri-food systems towards green and climate-resilient practices. For example, climate-smart applications can help farmers to track weather forecasts and find recommendations for feeding crops and livestock during specific weather events. With the development of new digital tools, fruitful collaborations can be established between scientists, funders and stakeholders, making successful climate adaptation more likely.

Physical and mental health also matters in adaptation. Climate change can make infectious diseases in humans worse and may even promote the development of new diseases. According to Anna Gunz, University of Western Ontario, Canada, environmental-related health issues tend to be underestimated in medical institutions. She explained that the existence of climate-induced diseases should be politically recognized so that more funds can be allocated to study their causes and mechanisms, and thus treatments can be developed for climate-related health adaptation [see also ref. [4]]. This will require better involvement of governments at the global scale.

Local policies are also key to address health issues. Vidya Anderson, University of Toronto in Scarborough, Canada, noted how rooftop gardens and green infrastructure can help improve mental and physical health, as they can provide access to local food, indigenous medicine and create a friendly space for sharing ideas and experiences. The benefits are thus multiple.

Climate change disproportionately affects people with disabilities, yet they are rarely considered in climate action (https://www.cbmuk.org.uk/news/disability-inclusion-in-climate-action-new-guide-published/). Laura Lynch, a Canadian television and radio journalist at Canadian Broadcasting Corporation, highlighted the lack of inclusion of people with disabilities in climate policies and suggested that governments around the world need to target this population group when adopting climate change adaptation and mitigation strategies.

Despite the many needs of population groups that do not yet have full participation in the design of adaptation strategies, some progress is being made. Governments and policymakers are starting to become more involved in climate adaptation initiatives. During the conference, Canada's environment ministers and city mayors explained how they are directly facing the consequences of climate change in their constituencies and what short- and long-term steps they are taking to prepare their infrastructure for future hazards and strengthen their resilience. For example, new dams are being installed to prevent flooding, fire corridors are established to reduce areas affected by fires and water use restrictions are imposed during the summer to reduce the impacts of droughts. Mayors and ministers all agreed that increased funding, closer collaboration between scientists, practitioners, stakeholders and policy makers, and better recognition of the scale of the challenge are needed to address the growing risks of future hazards.

While attending the conference, Canada experienced record temperatures, reaching over 29° for 3 consecutive days. These extraordinary and unprecedented conditions for the month of October made the debates and panel discussions more engaging and moving. We all left the event with strong intentions to make the world a little more resilient.

Published online: 15 December 2023

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