

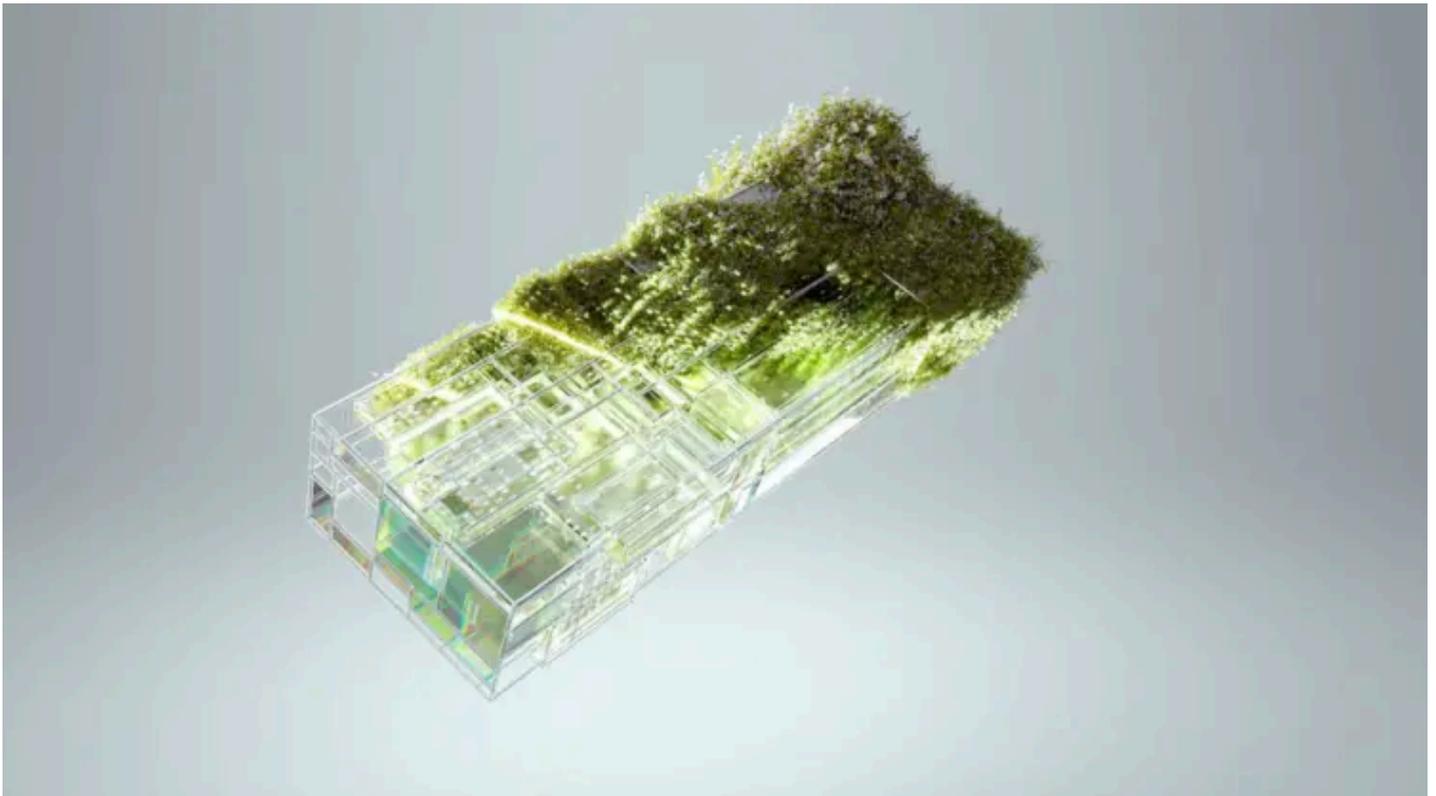
Series

Innovation in the Emerging AI & Climate Landscape

Artificial intelligence (AI) has the potential to transform climate action.

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The [Bonn AI Climate Expert Meeting](#) in July gathered tech experts, decision makers, community leaders and UN representatives to better understand opportunities and risks associated with AI employment for climate action in developing countries. This perspective article takes clues from the discussions highlighting developments around use-cases and necessary innovation.

AI use cases for climate action

AI technologies, including machine learning, neural networks and deep learning, have key capabilities and use cases in climate action. From processing and analysing vast data sets, to automating large-scale monitoring, enabling optimization, building predictive models and forecasts, and setting up digital twins – realistic simulations of the real world – the technological possibilities of the AI revolution

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However, use cases are too often concentrated in countries developing these tools, while there would be many opportunities to include social and indigenous knowledge within new developments, especially in the Global South.

Leapfrogging climate action with “big” AI?

Big tech companies have made available capacities to advance public good research. For example, an [AI predictive flood model](#) trained with publicly available datasets has been shown to lift the level of flood forecasting in Africa to that of Europe. Further work is ongoing for wildfires, drought and other climate related challenges.

Such work, however, relies on an open-source data ecosystem to train the models. The promoted models act as black boxes, and the underlying models are not open code. Thus, investing in primary climate data including remote sensing data is a necessity, and so is maintaining physical models for benchmarking, transparency and understanding uncertainties of AI solutions. Capacities need to be created in the public sphere to understand the use case of these transformational AI models and to gauge their limits and dependencies.

“Small” AI is beautiful

AI for climate does not only need to be thought of in large scale applications. “Small” AI (often referred to as edge AI) with local coding, locally customized and running on local workstations, has many use cases especially in Global South countries. This might also be an easier approach to include indigenous and social knowledge and ownership. However, it requires native human capacities for Global South countries to not only be consumers but developers of approaches and technological infrastructures. Setting up such transformational structures is one of the biggest policy challenges. Initiatives like [Climate Change AI](#) or [AfriClimate AI](#) are helping to make this happen.

Innovation partnerships

Tech developers have the tools, but not necessarily the perspectives, access and resources to carefully assess necessary use cases. Enhancing AI for climate action, thus, requires matchmaking for AI innovation by joint collaborations between private and public institutions, as well as research and academia. The [AI Alliance](#) is one such forum, however similar initiatives will have to evolve to further enable partnerships in Global South countries, with international agencies and local communities. Initiatives should also advocate for a climate data ecosystem that is fit to enable AI for climate. In addition, there are emerging capacities, especially for edge AI within the Global South. These capacities need to be strengthened, with data access, infrastructure and local control over the tools being developed.

Innovation is the implementation of creativity: Several challenge awards and prizes have been set up or are currently open, including the [UNFCCC AI Innovation Grand Challenge](#) the [Bezos Foundation AI for Climate and Nature Grand Challenge](#), or the [Innovative Africa challenge](#). Harnessing the imminent AI revolution in climate action is fundamentally a human endeavour, necessitating a future-positive vision that transcends the technology itself. It requires the collaborative efforts of various disciplines and communities, emphasizing the importance of adopting a narrative, framework and language with humility.

To fully harness the potential for climate action, we must prioritize innovation that bridges global divides. By fostering collaboration across disciplines, regions, and communities, we can ensure that new technologies not only enhance our ability to combat climate change but do so in a way that is fair, transparent and rooted in local knowledge. The future of climate action lies in uniting *technological progress with human creativity enabling all of us to face the challenges of a changing planet*

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