

# To know is not enough: Adaptation requires means

December 12, 2025 marks the 10th anniversary of the Paris Agreement, considered a breakthrough in climate change policy because it encourages all countries, rich or poor, to mitigate climate change according to their “respective capabilities,” by decreasing greenhouse gas emissions through “Nationally Determined Contributions (1).” Attending to adaptation, rather than mitigation, Hanif *et al.*’s Focus article in this issue of *Science Advances* posits that climate resilience in the poorest nations is impeded by a lack of research support dedicated to assessing the impact of climate change and to advancing adaptive solutions. They argue that the concentration of research support in the developed world exacerbates the differential in vulnerability between the poorest nations and the developed world, that we will refer to as the Global North and South.

The asymmetry between responsibility and vulnerability has been a central feature of climate change negotiations since their inception more than 30 years ago (2). It is manifest in the way that damage is expressed after the event of climate catastrophes (3): We count the lives lost in the Global South, and the millions or billions of US dollars in damages inflicted in the Global North. In addition, it is manifest in our expectation that entire geographies (the Small Island Developing States) or livelihoods (artisanal fisheries along the low-lying coasts of West Africa, rainfed agriculture subjected to the increasing vagaries of the monsoons) will disappear, while the richest of the rich will merely be inconvenienced by air travel disruptions or having to file insurance claims (4).

Hanif *et al.*’s argument is based on the correlation between country-level climate research output and vulnerability, which shows that “nations most vulnerable to climate impacts contribute minimally to climate research.” They infer that the lack of investment in climate research in the South not only results in fewer publications, but also in insufficient understanding of the problem where that understanding is most needed, hence greater vulnerability. There is a real causal inference problem here: Vulnerability is not the result of a lack of climate research, as vulnerability does not come from the sky. It is a product of a long history of colonial and neocolonial extraction, as is the lack of investment in climate research. Can this history be fixed by a transfer of climate-adaptation research support? Is it enough to call for the Green Climate Fund and the Global Environment Facility, the UN Environment Programme, the World Meteorological Organization, and the Intergovernmental Panel on Climate Change to support knowledge transfer and research finance? Or should these

institutions turn their attention to system-wide broader structural and political-economic inequalities, a consideration that has historically been excluded from climate negotiations (5)?

Although there is certainly a need for research support in the Global South, Hanif *et al.*’s conclusions beg some related questions: Does a lack of research funding imply less knowledge? Indeed, does research on indigenous ways of adaptive coping enhance adaptive coping? Or is the problem the lack of means to act upon already-held knowledge, again, a consequence of global economic inequalities?

There is also a tension between Hanif *et al.*’s call to “foster knowledge transfer and capacity building” and their call to mobilize indigenous knowledge. While funding more research in the South is positive, there is plenty of research already available, and, it would seem, locally held indigenous knowledge is available too. Local actors do not lack knowledge; they lack the means to act on it. Global initiatives do exist that bring indigenous knowledge into the fold of negotiations on adaptation to climate change, such as UNESCO’s Local and Indigenous Knowledge Systems (LINKS) ([www.unesco.org/en/links](http://www.unesco.org/en/links)) and the UN Development Programme’s Climate Promise (<https://climatepromise.undp.org/>). However, the key question remains: Why does transferred or indigenous knowledge remain unused? If there is so much indigenous knowledge, why don’t local people use it? Is it a lack of training and “capacity” or a lack of material means?

– Alessandra Giannini and Jesse Ribot

## REFERENCES

1. M. Mills-Novoa, D. M. Liverman, Nationally determined contributions: material climate commitments and discursive positioning in the NDCs. *Wiley Interdiscip. Rev. Clim.* **10**, e589 (2019).
2. B. K. Weinger, Thirty years on: Planetary climate planning and the Intergovernmental Negotiating Committee. *Glob. Environ. Chang.* **80**, 102669 (2023).
3. E. Boyd, B. C. Chaffin, K. Dorkenoo, G. Jackson, L. Harrington, A. N’Guetta, E. L. Johansson, L. Nordlander, S. P. De Rosa, E. Raju, M. Scown, J. Soo, R. Stuart-Smith, Loss and damage from climate change: A new climate justice agenda. *One Earth* **4**, 1365–1370 (2021).
4. A. Khalfan, A. Nilsson Lewis, C. Aguilar, M. Lawson, S. Jayoussi, J. Persson, N. Dabi and S. Acharya, Climate equality: A planet for the 99% (Oxfam GB for International, 2023); doi:10.21201/2023.000001, <https://policy-practice.oxfam.org/resources/climate-equality-a-planet-for-the-99-621551/>.
5. M. Frederiksen and M. A. Mottley, How to mobilize private climate finance (Project Syndicate, 2024); [www.project-syndicate.org/commentary/blended-finance-public-derisking-to-mobilize-private-capital-for-climate-investments-by-mette-frederiksen-and-mia-amor-mottley-2024-09](http://www.project-syndicate.org/commentary/blended-finance-public-derisking-to-mobilize-private-capital-for-climate-investments-by-mette-frederiksen-and-mia-amor-mottley-2024-09).

10.1126/sciadv.aee0726

Alessandra Giannini, Deputy Editor, Science Advances, Laboratoire de Météorologie Dynamique/IPSL, Ecole Normale Supérieure-PSL University, Sorbonne Université, École Polytechnique, IP Paris, CNRS, Paris, France. Email: [alessandra.giannini@lmd.ipsl.fr](mailto:alessandra.giannini@lmd.ipsl.fr)

Jesse Ribot, Department of Environment, Development & Health at American University, Washington, D.C.

Downloaded from <https://www.science.org> on February 14, 2026

Copyright © 2025 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. Distributed under a Creative Commons Attribution NonCommercial License 4.0 (CC BY-NC).

## To know is not enough: Adaptation requires means

Alessandra Giannini and Jesse Ribot

*Sci. Adv.* 11 (50), eaaa0726. DOI: 10.1126/sciadv.aaa0726

### View the article online

<https://www.science.org/doi/10.1126/sciadv.aaa0726>

### Permissions

<https://www.science.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of service](#)

---

*Science Advances* (ISSN 2375-2548) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science Advances* is a registered trademark of AAAS.

Copyright © 2025 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. Distributed under a Creative Commons Attribution NonCommercial License 4.0 (CC BY-NC).