

CLIMATE CHANGE

Is Weather Event Attribution Necessary for Adaptation Funding?

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International funds created largely for funding climate adaptation programs and projects in developing countries were first legally established through the seventh session of the Conference of the Parties (COP-7) to the United Nations Framework Convention on Climate Change (FCCC) held in 2001 at Marrakesh. In 2009, at COP-15 in Copenhagen, delegates “took note” of a pledge from developed countries to commit U.S. \$30 billion for the period 2010–2012, ramping up to \$100 billion per annum by 2020, to support a mixture of climate adaptation and mitigation activities in developing countries. International adaptation finance has therefore been, and continues to be, a significant political issue for the FCCC and for international institutions, such as the World Bank, the Global Environment Facility, and regional development banks (1). Yet governance arrangements and allocation principles for these climate adaptation funds remain both underdeveloped and politically contested (2, 3). A Green Climate Fund for disbursing such funds was established at COP-16 in Cancún, and a Transitional Committee is currently developing operational documents for the fund to be adopted at COP-17 in Durban, South Africa, later this year.

In this Policy Forum, we challenge claims made by proponents of the new science of weather event attribution that the capability of calculating the odds that specific weather extremes are caused by humans could assist in the allocation of international climate adaptation funds. By claiming such a new guiding principle, for example, in the context of the emerging loss and damage agenda (4), these proponents may unwittingly be providing convenient cover for those who would rather continue debating adaptation allocation principles than securing and investing new funds (see the photo). Instead, we argue that adaptation funding should continue to be



Flooding in Pakistan. Should weather event attribution inform the allocation of international adaptation funds?

distributed according to development needs and adaptive capacity, as negotiated by the FCCC over many years and as is currently practiced.

Probabilistic Event Attribution (PEA)

As outlined by Stone and Allen (5), probabilistically attributing specific meteorological extremes to human influences on the climate system leads to the concept of fractional attributable risk: What are the odds of a specific risk event being attributable to human influence? Probabilistic event attribution seeks to create two categories of weather extreme and, therefore, two categories of social and ecological impact: “human-caused weather” (and impact) and “tough-luck weather” (and impact). This seems to support the logic of the political definition of climate change enshrined in the FCCC—“A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (6). And yet in practice this distinction is frequently blurred in adaptation funding policy documents [e.g., (7)], which revert, implicitly, to the scientific definition of climate change, as used by the Intergovernmental Panel on Climate Change, which makes no

The new science of weather event attribution is unlikely to make useful contributions to adaptation funding decisions.

distinction between human-caused and natural changes in weather and climate.

Some climate scientists argue that there is an urgent need to develop the science of weather event attribution to assist with decisions about the allocation of new international adaptation funds. In their recent paper demonstrating the application of a “probabilistic event attribution” (PEA) framework to extreme flooding in the UK, Pall and coauthors (8) contend that the ability to quantify the contribution of human-based emissions to the risk of such a damaging event “could prove a useful tool for evidence-based climate change adaptation policy” (p. 385). One of the coauthors of this paper, Myles Allen, claims elsewhere that “because [adaptation] money is on the table, it’s suddenly going to be in everybody’s interest to be a victim of climate change [...] we need urgently to develop the science base to be able to distinguish genuine impacts of climate change from unfortunate consequences of bad weather” (9). Other scientists agree. Hoegh-Guldberg and coauthors state that “quantifying the impacts of anthropogenic climate change in this way is [...] important in guiding the allocation of resources available for adaptation” (10).

We argue here that rather than guiding adaptation funding decisions and making them simpler, PEA in this context is likely to increase the political and ethical complexities of these decisions. There are at least three fallacies with the argument that PEA can usefully contribute to the allocation of adaptation funds.

1) *Uncertainty and subjectivity.* Advocates of PEA claim it offers adaptation policy-makers a modeling framework that can adjudicate probabilistically on the causes of weather extremes and their impacts. Such “objectivity” may appear attractive to those charged with making difficult and politically and ethically charged decisions about adaptation funding. But although the PEA framework may appear to generate objective probabilities of particular extreme events being human-caused—for example, “anthropogenic greenhouse gas emissions increased the risk of floods occurring [in England] ... by more than 90%” [(8), p. 382]—in fact, it does not do so.

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PEA is a form of detection and attribution study, and all such studies are ultimately reliant on the ability of climate models to estimate what the climate would be without human influence on the system (11). These models are highly uncertain, are logically impossible to verify (12, 13), and yield knowledge claims that are contestable. PEA therefore offers subjective Bayesian probabilities—reflecting judgments about uncertainties in climate model design, selection, and operation—rather than objective frequentist probabilities (14). Rather than making decisions about adaptation funding easier, PEA subjectivities may simply open up new spaces for political contestation, but now hidden in the language of science.

2) *Discriminating hazard and risk.* PEA poorly discriminates between hazard and risk. Although studies such as that of Pall and coauthors (8) claim to be attributing flood risk to human influence on the climate system, the PEA methodology is only dealing with the meteorology of the risk event. [The authors recognize this: “we ... assume an unchanging relationship between hazard and resulting damage” (p. 382).] Fractional attributable risk would therefore be better termed fractional attributable hazard. But meteorological hazards are always mediated through complex political, social, and economic structures, which determine social vulnerability and which shape overall risk and management strategies. It is the impacts of mediated risk events, not of hazards per se, that adaptation funds are intended to preempt.

By focusing on the role of human agency as it contributes to only the meteorological hazard part of the risk, PEA studies are left with nothing to say about what is often the most important part of the risk attribution (15): What fraction of the overall risk—not just what fraction of the hazard—is attributable to human agency? Linking adaptation funds to (attributable) meteorological hazard rather than to the overall risk, would obscure significant ethical judgments behind a façade of scientific analysis.

If a formulaic approach to the allocation of adaptation funds was desired, it is here that fractional attributable risk studies potentially would be more useful. Yet such calculative approaches to guiding adaptation funding decisions could not do justice to the ethical complexity and political sensitivity involved. Decisions about where, when, and how to adapt and about the funding needed for such adaptation are, and always will be, political.

3) *Build capacity, not compensate loss.* Using PEA in adaptation funding allocations would imply that the purpose of international

adaptation finance is to compensate for damage caused by anthropogenic climate change. But operational and proposed new adaptation funds prioritize vulnerability through the building of adaptive capacity (3, 16), not compensation for loss. Although COP-16 in Cancún did establish a work program “to consider approaches to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change” (4), this is not an operational adaptation fund. By confusing the financing of adaptation with the compensation for loss, PEA advocates are departing significantly from 10 years of political negotiations under the FCCC (17) and are in danger of destabilizing progress made to date.

Scientizing Adaptation, Delaying Action

We have made three substantive challenges to those who suggest that the science of weather event attribution has a role to play in allocating international adaptation funds. First, given the Bayesian nature of PEA probabilities, introducing such calculations into the FCCC may exacerbate political conflicts. Second, PEA brackets out human agency as it applies to the conversion of meteorological hazard into risk event—yet this is arguably the more important consideration with regard to adaptation interventions. Third, PEA advocates seem to confuse the need for adaptation with arguments about compensation for damage caused.

PEA science and its putative relation with adaptation funding decisions offers a new variant on the “predict-and-adapt” paradigm that has pervaded climate modeling and parts of the adaptation policy community for some time (18, 19). Claims that PEA studies can contribute usefully to adaptation funding decisions are another example of believing that “objective” model-based evidence can displace the contested spaces of political decision-making. They place climate modeling at the heart of political decision-making about climate adaptation. This is to the detriment of both science and policy (20, 21). It further politicizes climate science, scientizes adaptation politics, and does little to advance decision-making on climate adaptation.

There are good reasons to further our understanding of human influences on weather extremes, but the desire to influence adaptation funding allocations is not one of them. Deciding where to allocate adaptation resources is a political decision and needs to be driven by factors such as vulnerability to hazard, institutional capacity, and social justice—not contestable scientific claims about

whether specific meteorological events are more or less likely to be human-caused. PEA will not offer an easy short-cut for those seeking to depoliticize adaptation funding. Instead of allocating time and resources in the fruitless search for an “objective solution” to the problem of allocating limited adaptation funds [compare the parallel argument in (22) about the use of objective vulnerability metrics in adaptation financing decisions], adaptation to climate risk should be recognized in and of itself as a public good and a development objective.

Whether a particular risk event was triggered by human or natural meteorology, there is an ethical imperative to build social resilience and institutional capacity to deal with all weather-related risks. The crucial point is that climate adaptation investment is most needed where vulnerability to meteorological hazard is high, not where meteorological hazards are most attributable to human influence.

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