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Background briefing

Loss and Damage Fund: the need for climate impact metrics

2023

Contents

Key points

- There are no formally agreed metrics that can be used to measure the impacts of human-induced climate change now and in the future, hindering loss and damage and adaptation assessments. For this reason, adaptation is not adequately addressed in the just-concluded 1st Global Stocktake (GST) cycle. **The IPCC should set up a task force on climate impact metrics to address this gap.**
- There is a **lack of robust climate and impacts data and research** in many of the countries that are highly vulnerable to the impacts of climate change. This particularly hampers efforts to assess climate change impacts on extreme weather in those places and also hinders the development of robust adaptation action.
- The development of climate change attribution science means that it is now possible in many cases to demonstrate a causal relationship between extreme weather events and human-caused climate change. However, there are limits to what is possible and it is essential that eligibility criteria for the Loss and Damage Fund are designed with this in mind. **If the evidentiary bar is set too high, the Fund will not be able to deliver on its aim to assist vulnerable countries in dealing with the worst impacts of climate change.**

Assessing Loss and Damage

The Loss and Damage Fund that was established at COP27 is intended to provide financial assistance to nations that are most vulnerable to the effects of climate change. While there is a general understanding that "loss and damage" refers to the negative consequences that arise from unavoidable risks of climate change, there is not yet a formally agreed definition of the term. Similarly, there are no agreed metrics that can be used to identify and measure loss and damage when it happens.

To implement the fund, decisions will be needed about what types of losses and damages are eligible. This includes considering eligibility for different types of:

- **Hazard** (including extreme weather events such as heatwaves, extreme rainfall, droughts, tropical cyclones, fires and heavy snow; and longer-onset events like sea level rise, desertification and acidification of the sea); and
- **Impact** (which are often described as 'economic'- relating to resources, goods and services- and 'non-economic' – relating to human lives, communities, cultural heritage and the environment).

The first step to making these decisions is to establish a set of agreed metrics on measuring the impacts of events caused by climate change. To do this, **the IPCC should set up a task force on climate impact metrics to mirror the existing Task Force on National Greenhouse Gas Inventories.**

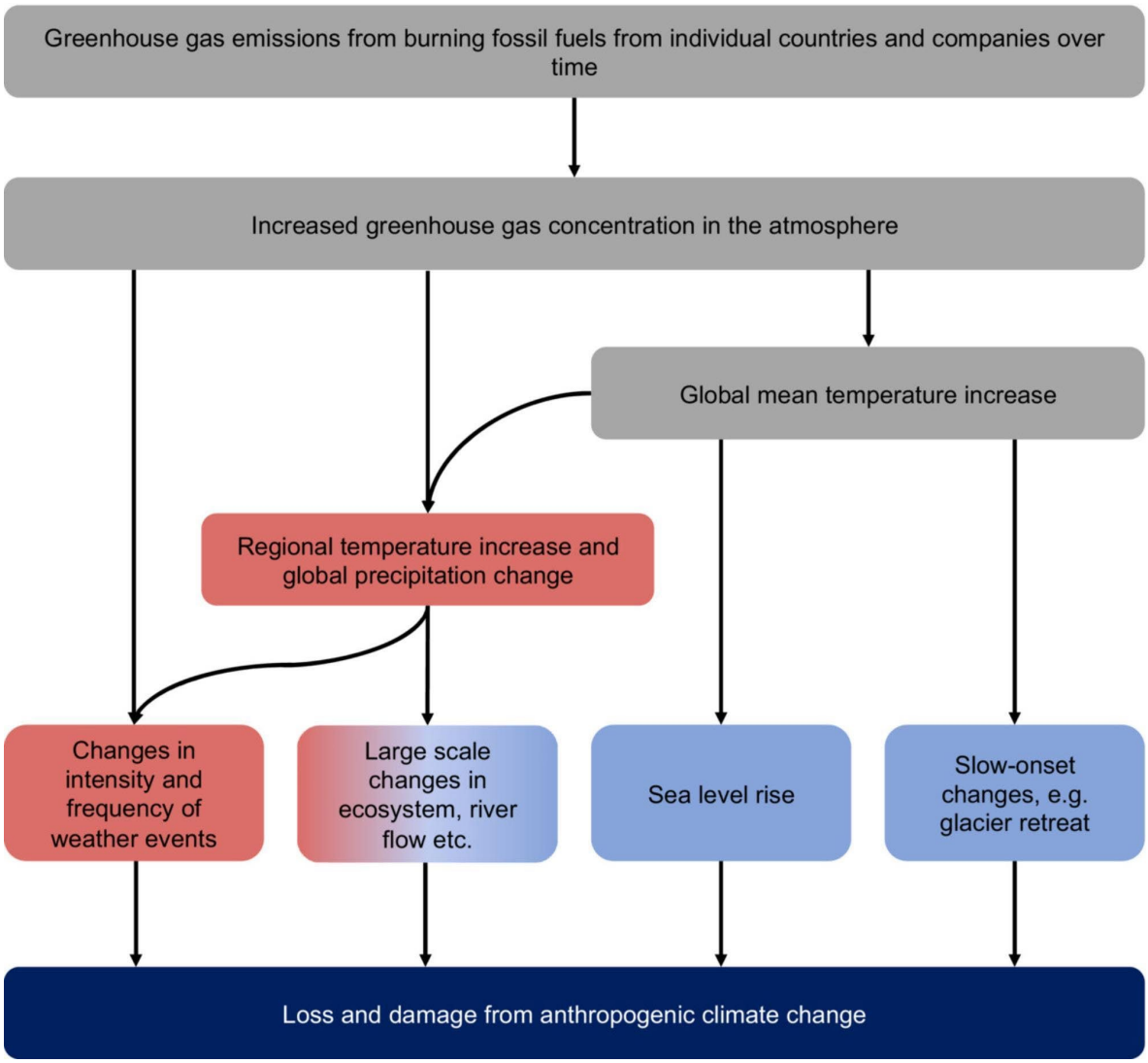
The existing well-established and agreed-upon metrics for measuring emissions, has served as foundation for setting mitigation goals and holding countries and companies accountable. This is lacking for adaptation and loss and damage.

There is also a question about whether it will be necessary to demonstrate a causal link between extreme events that have resulted in loss and damage and human-caused climate change. We explore this further below.

What role should climate change attribution science play?

Human-caused climate change causes loss and damage in a variety of ways, ranging from events that are seen on an immediate timescale, such as extreme weather events (shown in red in figure 1), to those that have a lagged time response, such as sea level rise (shown in blue in Figure 1).

Figure 1: chain of causality of how greenhouse gas emissions cause loss and damage. Source: Otto, F. E. and Fabian, F., 2023. Equalising the evidence base for adaptation and loss and damages. Global Policy.



Climate change attribution is an emerging field of science that combines climate model simulation and analysis of real-world weather data to calculate whether and to what extent human-caused climate change has made a specific extreme event more (or less) likely and/or intense (see examples below). Similar techniques can be applied to slow-onset events like glacier retreat or sea level rise.

For example, studies of recent extreme weather events have found that:

- Climate change more than doubled the likelihood of extreme fire weather conditions in Eastern Canada during May and June 2023. The extensive wildfires led to more than 150,000 people being evacuated.
- The maximum heat seen in the US and Mexico in July 2023 would have been virtually impossible without climate change. In Mexico alone, over 200 people died due to the heat.
- The extreme rainfall in Libya in September 2023, which resulted in devastating flooding and thousands of people being killed when two dams near Derna burst, has become up to 50 times more likely and up to 50% more intense as a result of human-induced climate change.
- The exceptional severity of the 2021-2022 Horn of Africa drought that led to widespread impacts to humans, including crop and harvest losses, livestock deaths, hunger and malnutrition would not have been possible without human-induced climate change.

The importance and limits of attribution science

One of the key genuinely new findings in the most recent IPCC assessment report is that "Human-caused climate change is already affecting weather and climate extremes in every region. This has led to widespread adverse impacts and related losses and damages to nature and people (high confidence). " This is a key finding based on assessing a large body of literature of climate attribution studies that demonstrate a causal link between extreme weather events and human-induced climate change. However, there are limits to what is practically possible through attribution science.

Assessing different types of extreme weather event

Some types of weather event are easier to study than others depending on how complicated their relationship to global warming is. Heatwaves and rainfall have relatively simple relationships to increased global temperatures and so are the most straightforward to study. Others—such as droughts, snowstorms, tropical storms and wildfires—are more complicated (for example multiple events may occur simultaneously or sequentially) and therefore may be more difficult to simulate using climate models. They also require high quality and long records of data from weather observations.

Availability of data

An important limiting factor is availability and access to real-world weather data and climate research. This is a particular problem in countries with scarce meteorological data and these are often exactly those places that are also most vulnerable to the impacts of climate change.

For example, in April 2023, heavy rainfall led to devastating flooding and landslides in Rwanda and the Democratic Republic of Congo, with at least 595 fatalities reported. Although an attribution study was attempted, limited historic and current weather observations as well as inadequate performance of climate models meant that it was not possible to assess the role that climate change had played.

We need more robust climate data and research in areas that are highly vulnerable to the impacts of climate change. This is not only to facilitate future claims to a Loss and Damage Fund but also to build a better understanding of the levels of vulnerability and exposure people have to extreme weather events so that adaptation action can be better supported and contextualised.

Designing a practical Loss and Damage Fund

The Loss and Damage Fund is intended to aid countries that are most vulnerable to the impacts of climate change. In designing a Loss and Damage Fund, and in particular in determining eligibility criteria, it is essential that the practical limitations of climate change attribution science are taken into consideration. There is a risk that evidentiary standards could be set too high, preventing the very countries that the Fund is intended to help from accessing the financial support that they should be entitled to. Equally, if standards are set too low, and insights from attribution science are not used at all, even in scoping eligibility, there is a risk of too many payout requests that again would disadvantages most vulnerable countries (primarily if no or too little funds are left when big climate-related disasters strike).

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Further reading

- Otto, F.E. and Fabian, F., 2023. Equalising the evidence base for adaptation and loss and damages. Global Policy.
- Clarke, B. and Otto, F.E., Reporting extreme weather and climate change: A guide for journalists. World Weather Attribution

Please cite as:

Otto, F., Kimutai, J., Bird, J., and Brandmayr, C. (2023). Loss and Damage Fund: the need for climate impact metrics. Grantham Institute background briefing.