

BRIEF

ASSESSING THE CLIMATE JUSTICE CASE FOR CATASTROPHE BONDS

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Introduction

Climate risk is increasingly showing up in sovereign credit risk. As physical impacts intensify, many countries face higher borrowing costs, greater fiscal strain, and reduced assess to financing [1]. But the issue is not only how climate risk is priced. It is how it is distributed.

Climate justice recognizes that countries that have contributed the least to global emissions are often among the most exposed to climate shocks and face the highest barriers to financing protection and recovery [2]. As a result, climate risk is concentrated on the balance sheets of countries least able to pay for protection, response, and recovery.

Catastrophe bonds are financial instruments that allow insurers, governments, and development institutions to transfer disaster risk to investors. Investors receive regular payments for taking on the risk, but if a predefined catastrophe occurs, some or all of their investment is used to help cover recovery costs instead of being repaid.

This makes catastrophe bonds relevant to climate justice because they can shift climate-related fiscal shocks away from vulnerable public balance sheets and toward diversified global capital, while creating a pathway to support resilience, adaptation, and recovery.

However, catastrophe bonds can be costly for governments and other issuers with constrained budgets. And, they require careful design to ensure they are not only profitable for investors, but also incorporate risk reduction into pricing, link capital to post-disaster recovery outcomes, and support pre-disaster investment in resilience.

This briefing assesses the opportunities and limitations of catastrophe bonds as tools for climate justice. It provides recommendations for interventions at the deal and market levels to help ensure that catastrophe bonds more equitably distribute climate-related financial risk, support resilience, and improve recovery outcomes, while remaining attractive to investors.

[1] The debt and climate crises are escalating—it is time to tackle both (Brookings 2022)
[2] Africa and climate justice at COP27 and beyond: impacts and solutions through an interdisciplinary lens (Williams, et al., 2023)
[3] Greening the international monetary system? Not without addressing the political ecology of global imbalances (Svartzman & Althouse, 2020)

Context: Climate risk is becoming credit risk

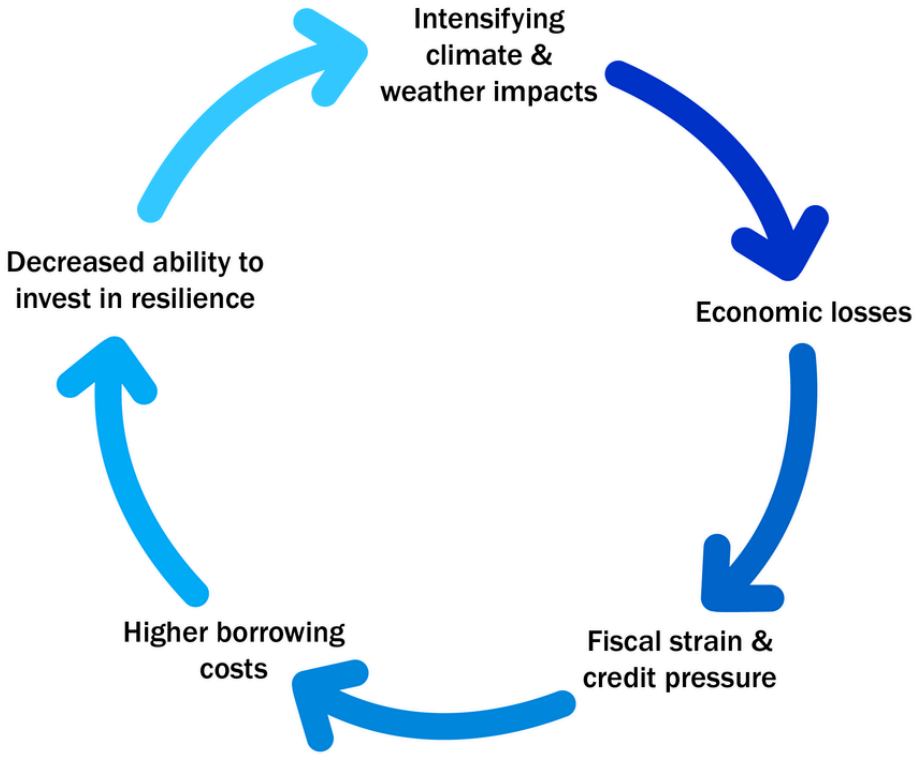
When storms, floods, droughts, and other disasters occur, the financial impacts are often absorbed by public budgets. Governments must repair infrastructure, support households, restore critical services, and fund recovery. For countries with limited fiscal capacity, these costs can **increase debt burdens, weaken credit profiles, and raise borrowing costs.**

This creates a reinforcing cycle (see figure 1):

- Climate events lead to economic losses.
- Economic losses lead to fiscal strain.
- Fiscal strain leads to credit pressure
- Credit pressure raises borrowing costs.
- Higher borrowing costs reduce the ability to invest in resilience

This is the financial dimension of climate justice. Countries with limited fiscal capacity are often required to pay meaningful shares of national income to protect against, respond to, and recover from risks they did not create.

Figure 1



Lessons from Jamaica's catastrophe bond experience

Recent catastrophe bond issuances illustrate some of the potential opportunities and challenges around catastrophe bonds as tools for more equitably financing climate risk. While the bonds can supply much-needed funding for disaster response and recovery, they usually provide only a fraction of the overall funding required. And, the cost of that protection often is carried by public budgets that already are constrained.

For example, in 2024, Jamaica issued a $150 million catastrophe bond. The terms of the bond required the country to pay investors $10.5 million per year in risk premium [4] [5]. After Hurricane Melissa, a category 5 hurricane, blasted Jamaica in October 2025, the bond paid out in full to help fund the nation's recovery. Officials said that as a result of the payout, affected communities on the western half of the island had their electricity restored at least three months earlier than anticipated [6].

However, the total damage and losses from the storm were estimated at USD $12.2 billion [7]. The $150 million bond payout covered, at best, 1.2% of recovery costs.

Moreover, converted into Jamaican dollars, the $10.5 million annual premium for the 2024 bond is roughly comparable to the Jamaican government's 2025/2026 allocation for infrastructure improvements across the nation's primary and secondary schools [8]. This highlights a core tension: the cost of transferring risk can be significant relative to fiscal capacity. Securing financial protection from disasters competes with other urgent national priorities.

This is not unique to Jamaica. It reflects a broader pattern in which countries most exposed to climate risk must commit significant financial resources simply to access protection.

The result is a mismatch: climate risk is increasingly priced by markets, but the burden of that risk often remains concentrated on the balance sheets least able to absorb it.

[4] New Catastrophe Bond Supports Jamaica's Fiscal Risk Mitigation (Fitch Ratings, 2024)
[5] World Bank Catastrophe Bond Renews $150 Million Hurricane Coverage for Jamaica (The World Bank, 2025)
[6] Jamaica's parametric cat bond payout funded electricity restoration: Chief Fiscal Economist, Francis (Artemis, 2026)
[7] Jamaica after Hurricane Melissa: Building Resilience through Disaster Risk Financing (IADB, 2026)
[8] Gov't Unveils Strategic 2025/26 Budget That Prioritises Recovery and Sustainable Growth (Jamaica Information Services, 2025)

Catastrophe bonds as tools for more equitably allocating risk

Jamaica's experience illustrates why catastrophe bond design and market dynamics matter. The question is not only whether risk is transferred, but whether that transfer helps vulnerable countries protect public budgets, recover faster, and access capital on more reliable terms.

Catastrophe bonds can be more than risk transfer instruments. They can potentially help reallocate climate risk more equitably across the global financial system. They can serve three core functions:

Balance Sheet Stabilization

- Catastrophe bonds may provide pre-funded capital that can be deployed quickly after a disaster, reducing the need for emergency borrowing and supporting faster recovery.

Risk Redistribution

- Catastrophe bonds may transfer risk from sovereigns to global capital markets, broadening who absorbs climate-related losses.

Market Signaling

- Catastrophe bonds may embed climate risk into pricing, creating a transparent link between hazard exposure and cost of capital.

Through these three functions, catastrophe bonds can play a role in addressing financial and risk imbalances and supporting climate justice. They move risk away from the most exposed balance sheets and distribute it more broadly across investors.

But current design has limits. Pricing is primarily based on modeled expected loss. It does not consistently reflect resilience investments, adaptive capacity, or recovery dynamics. As a result, the catastrophe bonds market can efficiently transfer risk *without necessarily improving outcomes on the ground*.

The key question is not whether the bonds transfer risk, but whether the terms of that transfer match the realities of disaster recovery. If the trigger, timing, or use of funds is misaligned with actual needs, the instrument can succeed financially *while falling short as a resilience tool*.

Key gaps in current design

For catastrophe bonds to support more effective and equitable risk allocation, three gaps must be addressed.

The pricing gap

Catastrophe bond pricing is generally driven by modeled expected loss, hazard exposure, and investor compensation for risk. That is necessary, but incomplete.

Pricing does not yet consistently account for whether an issuer has reduced vulnerability through adaptation, stronger building standards, ecosystem restoration, improved emergency response, or other resilience investments.

If resilience lowers expected losses, that should eventually be reflected in financing terms.

The outcome gap

Most catastrophe bonds are triggered by the occurrence or modeled severity of an event, not by the quality or speed of recovery.

That means a structure can provide rapid liquidity while still leaving important questions open. Did the payout match actual recovery needs? Did it help restore power, hospitals, schools, ports or transportation networks faster? Did it reduce disruption for affected communities?

A more outcome-oriented market would not replace event-based triggers, but it would better connect financial design to recovery performance.

The data access gap

Capital tends to flow most easily to risks that can be modeled, disclosed, and compared. That creates a disadvantage for underserved sovereigns, municipalities, and regions where data availability is limited, or transaction costs are high.

This is a climate justice issue as much as a design issue. If the countries and communities most exposed to climate risk have less available data, lack technical assistance, and lack standardized structures needed to reach investors, then those communities will continue to face the greatest risks while receiving the least financial protection. Investors seeking catastrophe bond investment opportunities should help address these gaps through their engagement with other stakeholders in the market: governments and communities who are bond issuers, as well as regulators, and modelers and consultants involved in bond design.

Overcoming current design limitations

At the deal level: Integrate resilience financing and risk transfer

The next evolution of catastrophe bond deals is not just better pricing of risk. It is better alignment of capital with resilience.

Catastrophe bonds can do more than transfer losses. They can help finance and incentivize adaptation by connecting risk transfer to three related goals: incorporating resilience into pricing, linking capital to recovery outcomes, and supporting investments that improve community resilience before disasters occur.

1. Incorporating resilience into pricing

If infrastructure is hardened, ecosystems are restored, or building standards are improved, that should be reflected in lower risk premiums over time. This would align financial incentives with real-world risk reduction.

For example, if mangrove restoration reduces storm surge exposure for coastal communities, that reduction in physical risk should translate into lower premiums for disaster-risk financing.

Similarly, if homes are strengthened to higher wind standards, or critical facilities are protected against flooding, investors should recognize they are less at-risk, and provide financing on more favorable terms.

Many models used to develop catastrophe bonds do not yet account for the benefits of resilience investments. Investors should push for additional engineering and actuarial research, standards, and model improvements that enable resilience measures to be priced into catastrophe bonds.

2. Linking capital to recovery outcomes

Catastrophe bond structures can evolve to consider recovery speed, service restoration, or reduced economic disruption, rather than relying solely on event-based measures of loss.

For example, a hurricane-exposed country that invests in grid hardening, hospital resilience, or faster emergency systems should be able to demonstrate not only lower physical losses, but a faster return to normal economic activity after a storm.

Future structures could recognize whether critical services, such as electricity, hospitals, schools, ports, or transportation networks, are restored faster after a disaster. This would help shift the focus from whether a storm occurred to whether the financing helped reduce disruption and speed recovery.

3. Supporting resilience investment

Catastrophe bonds can be paired with programs that reduce risk before disasters occur. In North Carolina, for example, the North Carolina Insurance Underwriting Association's Strengthen Your Roof and Strengthen Your Coastal Roof programs provide grants to eligible coastal policyholders to upgrade homes to the IBHS FORTIFIED Roof standard, helping reduce wind damage, lower future losses, and stabilize insurance costs over time. The grant programs are partially funded through the bond structure [9], and the arrangement constitutes a rare, real-world example of a "resilience bond," where risk reduction and risk transfer are explicitly connected.

For investors, this represents a shift from passively pricing climate risk to identifying where resilience can change the risk itself.

If stronger infrastructure, better building standards, or ecosystem protection reduce expected losses, investors who recognize those changes early can earn better risk-adjusted returns.

That makes resilience more than a public benefit. It becomes a source of market differentiation. Better resilience data can help investors identify overpriced risks, avoid under-protected risks, and support structures that reduce losses over time.

At the market level: Improve transparency, increase issuer access

The market needs more than innovation at the individual deal level. It needs clearer standards and more accessible pathways so catastrophe bonds can better support resilience, recovery, and climate justice.

1. Standardizing disclosure

Investors need more consistent information across transactions, and issuers need clearer ways to show how a catastrophe bond supports public resilience. Disclosure should include what geographies, assets, and populations are covered; what risks are excluded; how triggers were modeled; how payout amounts relate to expected recovery needs; and what resilience investments have already been made.

This would make deals easier to compare, improve investor confidence, and help governments demonstrate that the instrument is supporting resilience rather than simply transferring financial risk.

[9] NCIUA's recent catastrophe bond included integrated disaster-resilience feature (Artemis, 2025)

2. Making basis risk more visible

Parametric catastrophe bonds can provide fast, transparent payouts because they pay based on predefined characteristics—e.g., storm track, central pressure, or wind speed—rather than on assessments of actual damage. But this feature also creates basis risk: the possibility that the payout does not match the issuer's actual losses or recovery burden.

For sovereign issuers, this is a public finance issue, not only a modeling issue. A country may face serious damage to homes, roads, hospitals, schools, ports, or power systems, but receive little or no payout if the event does not meet the bond's specific triggers. Jamaica's experience after Hurricane Beryl in 2024 illustrates this risk: despite significant storm impacts, the country's catastrophe bond did not trigger because the storm's path and central pressure did not meet the bond's predefined parameters [10].

Future structures should make this risk more visible by quantitatively or qualitatively showing how trigger variables, covered zones, attachment points, and payout amounts relate to vulnerable populations, critical public assets, and expected recovery needs. This would help ensure that catastrophe bonds are evaluated not only by how efficiently they transfer risk, but by whether they provide meaningful protection when public recovery needs are greatest.

3. Developing resilience-impact criteria

The market also needs clearer criteria for when a catastrophe bond can credibly be described as supporting resilience or impact. This could include evidence that the structure reduces the protection gap, covers vulnerable populations or critical public assets, supports adaptation planning, or links post-event reporting to recovery outcomes.

These criteria would help distinguish ordinary risk transfer from structures that advance measurable resilience benefits.

4. Expanding issuer access

Existing World Bank and disaster risk finance programs have helped sovereign issuers access catastrophe bond markets, but the pathway remains **technical, costly, and uneven**. Sovereign and sub-sovereign issuers in high-risk regions need clearer pathways to the market, supported by practical standardization and technical assistance.

In practice, this could mean **issuer readiness diagnostics, model term sheets, trigger design guidance, disclosure templates**, and **additional resourcing for technical support** from development banks or other partners. These tools would reduce transaction costs, clarify who and what is protected, and help smaller or lower-capacity issuers access catastrophe bond markets on more credible and affordable terms.

[10] Catastrophe Bonds Dodge Losses After Beryl Hits Jamaica (Insurance Journal, 2024)

Conclusion

Markets are beginning to price climate risk. The next step is to ensure that risk is not concentrated on the most vulnerable balance sheets.

Catastrophe bonds offer one path forward. They already redistribute risk across the financial system by transferring disaster losses from sovereigns and insurers to global capital markets. With targeted evolution, they can also help direct capital toward resilience, adaptation, and faster recovery.

Climate justice, in this context, is not only about who is exposed to climate impacts. It is about who pays for them, and whether financial systems reinforce or reduce that imbalance.

The opportunity now is to make catastrophe bonds not only efficient tools for risk transfer, but also more effective instruments for resilience and climate justice.