

Strengthening Resilience: Catastrophe Bonds and Emerging Risks

Introduction:

In recent years, Nigeria has been increasingly exposed to various natural disasters, including flooding, droughts, and disease outbreaks, which have taken a toll on its economy and population. According to the United States Government's Nigeria Complex Emergency Fact Sheet,¹ seasonal heavy rains and subsequent flooding had adversely affected more than 157,000 people and displaced an estimated 68,000 people across Nigeria as of October 2023, exacerbating already high levels of humanitarian need and requiring urgent food and shelter assistance. In addition to the devastating human toll, natural disasters can have dire economic consequences for disaster prone countries, especially for emerging countries which typically have extremely low rates of insurance penetration. For example, in 1998, Hurricane Mitch generated uninsured losses in Honduras equal to 34% of the country's gross domestic product (GDP) and 158% of government revenues. Such events have a negative impact on public finances as governments are often required to cover the costs of emergency and relief efforts, as well as reconstruction work. Consequently, resources are often diverted from other important development programs to fund disaster relief and recovery operations, which has a significant adverse impact on economic development.

The growing frequency and severity of natural disasters in recent years has intensified the negative economic impact on affected countries; and, yet most governments do not have access to insurance against these events due to high costs or the insurance industry's inability or unwillingness to absorb the risks of catastrophic events, particularly in high-risk areas.²

¹ USAID, 'Nigeria-Complex Emergency Fact Sheet #1 Fiscal Year (FY) 2024' (Situation Report) (2023)

<https://reliefweb.int/report/nigeria/nigeria-complex-emergency-fact-sheet-1-fiscal-year-fy-2024> accessed 9 September 2024.

² Alejandro Garcia, Nirmaljit S. Paul and Ivan Zelenko, 'The Euromoney International Debt Capital Markets Handbook' (2011) <https://documents1.worldbank.org/curated/en/393111507025134952/pdf/120186-BRI-PUBLIC-euromoney-handbook-2011-world-bank-multicat-program.pdf> accessed 9 September 2024.

Accordingly, as Nigeria strives to strengthen its resilience against these disasters, exploring innovative financial instruments that mitigate the impacts of these incidents is an important element. Catastrophe bonds have emerged as one of such critical financial instruments for disaster risk management. This article examines these instruments, their utilisation by global entities such as the World Bank, and why countries like Nigeria should consider their adoption.

What is a Catastrophe Bond?

Catastrophe bonds are debt instruments that transfer risk for specifically named catastrophic events (earthquakes, cyclones, etc.) from one party (typically the government or an insurance company) to the investors who buy the bonds. Payment of the bonds is only triggered if the particular event(s) designated in the instrument occur.³ Traditionally, catastrophe bonds have been primarily issued by companies, especially insurers and reinsurers, to transfer the risk of large-scale disasters to the capital markets. However, more recently, there has been a noticeable rise in the issuance of catastrophe bonds by sovereign governments and regional risk pools. Sovereign governments and regional risk pools⁴ have turned to catastrophe bonds as a way to manage the financial risks associated with natural disasters and other large-scale catastrophic events. By issuing these bonds, they can access a broader pool of capital and transfer some of the financial risks associated with catastrophes away from their own balance sheets.

Catastrophe bonds typically offer financial protection against specific perils such as earthquakes, hurricanes, or floods, with predetermined payout mechanisms triggered by catastrophic events. Investors benefit from catastrophe bonds due to their minimal correlation with equity and bond markets, as well as economic instability thereby allowing investors to diversify their portfolios and enhance their risk-return profiles. Furthermore, catastrophe bonds typically pay higher interest rates to investors when compared to alternative investments to compensate for the risk of the issuer's likelihood of not repaying the principal in the event of a qualifying catastrophe.

Catastrophe bonds can be broadly classified into 2 categories: indemnity-based and parametric-based bonds. Indemnity-based bonds provide coverage based on actual losses incurred, while parametric-based bonds use predefined triggers, such as wind speeds or earthquake magnitudes, to determine payouts.

The World Bank has played a pivotal role in facilitating catastrophe bond issuances to provide financial assistance to disaster-prone regions. For example, the World Bank's MultiCat Program, a multi-issuer platform designed for sovereign entities to transfer a portion of their natural catastrophe risk to investors through the capital markets, provides ready-made infrastructure that permits the World Bank's member governments to access catastrophe bonds in a fast and efficient manner.⁵ Collaborations between the World Bank and countries like Mexico, Chile, and Peru have resulted in catastrophe bonds that offer rapid access to funds for disaster response and recovery efforts.

Illustration of a Typical Catastrophe Bond Structure:

In a simple structure under a typical catastrophe bond, the sponsor enters an insurance contract with a special purpose vehicle (SPV) that issues notes to capital markets investors through financial institutions. The SPV thus acts as special purpose insurer as well as a special purpose issuer. It invests the proceeds of the notes in highly rated assets (AAA-rated assets such as US Government securities) and transfers the return on this investment, along with the insurance premiums paid by the sponsor under the insurance contract, to the buyers of the notes as the periodic coupons. The assets are held in a collateral trust. Catastrophe bonds specify the type of natural disaster that they cover (e.g., earthquake, hurricanes). A typical component of the catastrophe bond is the trigger mechanism used to determine the insurance payment under the bond. There are several types of triggers which differ in complexity as well as in terms of the residual (or basis) risk that the sponsor is left with. Some commonly used triggers, of increasing complexity but decreasing

³Climate Policy Initiative' <https://www.climatepolicyinitiative.org/gca-africa-adaptation-finance/instruments/catastrophe-bonds/> accessed 16 September 2024.

⁴ Meaning collaborative initiatives among countries that offer parametric insurance products to help them access quick financial resources in the event of disasters.

⁵ Alejandro Garcia, Nirmaljit S. Paul and Ivan Zelenko, 'The Euromoney International Debt Capital Markets Handbook' (2011) <https://documents1.worldbank.org/curated/en/393111507025134952/pdf/120186-BRI-PUBLIC-euromoney-handbook-2011-world-bank-multicat-program.pdf> accessed 9 September 2024.

basis risk for the sponsor, are parametric index, model loss index, and indemnity, among other things.⁶

If a specified disaster event occurs and the trigger condition is met, the SPV liquidates the assets held in the collateral trust and uses the proceeds to make an insurance payout to the sponsor in accordance with the provisions of the insurance contract. In such a case, investors suffer a loss of their principal. If no event occurs during the life of the bond, the SPV returns the entire principal to the investor at maturity.⁷ Thus, investors in the bond take the risk that all or part of their principal may be lost if a covered event occurs during the life of the bond and receive a coupon that reflects this risk.⁸

Let's consider a hypothetical catastrophe bond issuance by the Nigerian government to protect against the risk of severe flooding in risk prone regions. Here's how the bond might be structured:

- a. **Issuer:** The Nigerian government, through its designated disaster risk management agency, will initiate the creation of an SPV which will act as the issuer of the catastrophe bond. Alternatively, the Nigerian Government may issue through the World Bank. In this structure, the World Bank acts as the issuer/insurer and issues the bond under its "capital-at-risk" note issuance program, this removes the need for an SPV.
- b. **Use of proceeds:** The proceed of the issue will be invested in AAA-rated assets as agreed in the transaction documents.
- c. **Trigger mechanism:** The bond will include a parametric trigger based on predetermined criteria, such as rainfall levels or water levels in rivers. If these criteria exceed specified thresholds during the bond's term, triggering a severe flood event, the bond is activated, and payouts are initiated.
- d. **Investors:** Institutional investors, such as pension funds, hedge funds, and reinsurance companies, will participate in the bond issuance by purchasing the bonds. In return, they will receive regular coupon payments throughout the bond's term.
- e. **Coupon payments:** The coupon payments are funded by returns on the investments and the premiums paid by the Nigerian government during the bond's term.
- f. **Payouts:** Where no event occurs during the life of the bond, the SPV returns the entire principal to the investor at maturity.⁹ However, if the insured event occurs and the trigger conditions are met, the catastrophe bond will be triggered, and relevant payout(s) will be made to the Nigerian government. The SPV will be required to liquidate the assets it holds under the bond and pay the Nigerian Government as agreed in the bond documents. These funds will then be used to finance emergency response efforts, support affected communities, and facilitate post-disaster recovery initiatives.
- g. **Term and redemption:** The catastrophe bond will have a predetermined term, typically ranging from 1 to 3 years. At the end of the term, if no trigger events occur, investors receive their principal investment back, along with any remaining coupon payments.

⁶ Alejandro Garcia, Nirmaljit S. Paul and Ivan Zelenko, 'The Euromoney International Debt Capital Markets Handbook' (2011) <https://documents1.worldbank.org/curated/en/393111507025134952/pdf/120186-BRI-PUBLIC-euromoney-handbook-2011-world-bank-multicat-program.pdf> accessed 9 September 2024.

⁷World Bank, 'MultiCat Program Product Note' <https://thedocs.worldbank.org/en/doc/438301507314977367-0340022017/original/productnotemulticatprogramcatbond2015.pdf> accessed 9 September 2024.

⁸ Alejandro Garcia, Nirmaljit S. Paul and Ivan Zelenko, 'The Euromoney International Debt Capital Markets Handbook' (2011) <https://documents1.worldbank.org/curated/en/393111507025134952/pdf/120186-BRI-PUBLIC-euromoney-handbook-2011-world-bank-multicat-program.pdf> accessed 9 September 2024.

⁹ World Bank, 'MultiCat Program Product Note' <https://thedocs.worldbank.org/en/doc/438301507314977367-0340022017/original/productnotemulticatprogramcatbond2015.pdf> accessed 9 September 2024.

Examples of Catastrophe Bond Issuances:

Several countries and organisations have issued catastrophe bonds to manage their exposure to natural disaster risks. Some examples are:

- a. *Mexico's Catastrophe Bonds:* Mexico is one of the world's 30 most exposed countries to natural hazards. With 41% of its territory and 31% of its population exposed to hurricanes, storms, floods, earthquakes, and volcanic eruptions, the costs of post-disaster reconstruction of public assets and low-income housing averages US\$880 million per year.¹⁰ Mexico issued the world's first sovereign catastrophe bond in 2006,¹¹ followed by additional catastrophe bonds issued in 2009,¹² 2012, and 2017 in order to provide Mexico with financial protection against losses from covered natural disasters such as earthquakes and tropical cyclones.¹³ The 2017 catastrophe bond, known as the World Bank's "Catastrophe Bond for Mexico" provides financial protection against earthquakes and hurricanes. The bond offered coverage of up to \$360 million and was triggered by predefined parametric triggers related to seismic activity and wind speeds.
- b. *Chile Catastrophe Bond:*¹⁴ is a \$350 million World Bank catastrophe bond that provides the Government of Chile with financial protection against severe earthquake events for 3 years from 2023. Chile's high exposure to earthquakes significantly impacts the government budget. This transaction offers financial resilience as part of a broader government strategy of disaster risk preparedness and fiscal responsibility.¹⁵
- c. *Pacific Alliance Catastrophe Bond:* The Pacific Alliance catastrophe bond was the first simultaneous issuance for 4 sovereign entities (Colombia, Chile, Mexico, and Peru), as well as the largest earthquake catastrophe bond ever issued, offering a combined US\$1.36 billion in earthquake cover.

Payouts and Effectiveness:

Catastrophe bonds have demonstrated their effectiveness in providing timely payouts to affected parties following catastrophic events. For instance:

- a. *Mexico's Catastrophe Bond:* In September 2017, when a 7.1 magnitude earthquake hit Mexico City, a payout of US\$150 million from a World Bank issued catastrophe bond was paid to Mexico. This was a full payout from the earthquake exposed catastrophe bond tranche issued in August 2017. Also, in 2021, Mexico's catastrophe bond was triggered by Hurricane Delta, resulting in a payout of \$150 million to the Mexican government to support recovery efforts in affected areas.
- b. *Philippines Catastrophe Bonds:* Under Philippines' \$225 million catastrophe bond covering earthquakes and tropical cyclones, the super typhoon Rai in December 2021 triggered a partial 35% pay-out of the typhoon tranche of \$52.5 million out of a principal amount of \$150 million. The premium equivalent of that tranche was 5.65% or \$8.475 million per annum.

¹⁰World Bank, 'Insuring Mexico against Natural Disasters' (2020) <https://thedocs.worldbank.org/en/doc/7371515852549402840340022020/original/FONDENMexicoCatBondCaseStudy3.4.2020final.pdf> accessed 8 September 2024.

¹¹ Mexico's US\$160 Catastrophe Bonds which transferred earthquake risks in 3 regions of Mexican territory to the international capital markets through the issued securities.

¹² Mexico was the first country to issue notes using the MultiCat Program, with a 4 tranche US\$290m transaction in October 2009.

¹³ 'Mexico's Catastrophe Bonds Provide Financial Protection Against Losses from Covered Natural Disasters' <https://www.greenfinanceplatform.org/policies-and-regulations/mexico%E2%80%99s-catastrophe-bonds-provide-financial-protection-against-losses> accessed 9 September 2024.

¹⁴ It is the first World Bank bond and the first cat bond listed on the Hong Kong Exchanges and Clearing Limited.

¹⁵ World Bank, 'World Bank and Hong Kong Partner on a \$350 Million Cat Bond for Chile' (2023) <https://www.worldbank.org/en/news/press-release/2023/03/28/world-bank-and-hong-kong-partner-on-a-350-million-cat-bond-for-chile> accessed 9 September 2024.

Why Nigeria Should Consider Catastrophe Bonds:

In 2018, during the Lassa Fever outbreak in Nigeria, the World Bank Group recognized the country as a potential beneficiary under its pandemic catastrophe bonds, specifically the Class B tranche issued to support the Pandemic Emergency Financing Facility.¹⁶ This \$95 million tranche covered a range of pandemic risks, including Lassa Fever, Coronavirus, and other high-risk diseases. While the payout was contingent on specific triggers, this event highlighted Nigeria's potential involvement in global catastrophe bond mechanisms.

Given Nigeria's vulnerability to various natural hazards such as floods, droughts, and epidemics, catastrophe bonds offer significant benefits to help mitigate these risks in the following ways:

- a. **Transfer of risk:** By issuing catastrophe bonds, Nigeria can transfer the financial risk associated with natural disasters to investors in the capital markets, thereby reducing the burden on government finances.
- b. **Budgetary stability:** Catastrophe bonds offer predictable payout structures, providing governments with greater budgetary certainty in the event of a disaster.
- c. **Access to capital:** Accessing the global capital markets through catastrophe bonds will enable Nigeria raise significant funds for disaster preparedness, response, and recovery efforts.
- d. **Innovative financing:** Embracing catastrophe bonds will demonstrate Nigeria's commitment to innovative financing solutions and will strengthen the country's resilience against future shocks.

Recently, the National Economic Council discussed the possibility of insuring Nigerians from unanticipated natural disasters like earthquakes and floods.¹⁷

Catastrophe bonds, despite being more costly than comparable insurance policies and incurring higher frictional costs, are experiencing increasing demand, with active promotion by the World Bank. They serve as a proven financial tool, swiftly providing funding for emergency response post-disaster, and may attract additional donor subsidies in the future. Unlike most commercial catastrophe bonds, sovereign catastrophe bonds operate on a parametric insurance basis, triggering payouts upon predefined events rather than proof of loss, thereby ensuring rapid response, often within 14 days. This structure minimizes counterparty risk, offering countries budget predictability with tenors typically extending 3 years or more.

ESG Considerations:

Catastrophe bonds align with Environmental, Social, and Governance (ESG) principles by promoting resilience against natural disasters, supporting disaster-prone regions, and fostering sustainable risk management practices. Institutional investors increasingly view catastrophe bonds as ESG-friendly investments due to their positive societal impact and alignment with sustainability goals. By providing financial protection against natural disasters, catastrophe bonds contribute to:

- a. **Environmental resilience:** Catastrophe bonds support initiatives aimed at mitigating the impacts of climate change-related disasters, such as hurricanes and floods, thereby promoting environmental sustainability.
- b. **Social stability:** Timely payouts from catastrophe bonds enable governments finance emergency response efforts, protect vulnerable populations, and facilitate the reconstruction of critical infrastructure, fostering social stability and resilience in affected communities.

¹⁶ The facility was closed in 2021 and was set up as a financing mechanism housed at the World Bank designed to provide an additional source of financing to help poor and susceptible countries respond to cross-border, large-scale outbreaks.

¹⁷ Saumya Jain, 'National Economic Council considers insuring Nigerians against natural disasters : report' (2023) <https://www.reinsurancene.ws/national-economic-council-considers-insuring-nigerians-against-natural-disasters-report/> accessed 9 September 2024.

- c. **Governance transparency:** The transparent and parametric nature of catastrophe bond triggers enhances governance transparency and accountability, instilling investor confidence in the effectiveness of risk transfer mechanisms.

Prospects and Conclusion:

As Nigeria grapples with the challenges of natural disasters, public health crises, and other emerging risks, catastrophe bonds present a proactive and innovative solution for managing these events. By adopting catastrophe bonds, Nigeria can strengthen its resilience, safeguard vulnerable communities, and support sustainable development.

In addition, catastrophe bonds align with Environmental, Social, and Governance (ESG) principles, making them appealing to institutional investors focused on advancing environmental and social sustainability

Finally, the catastrophe bond market offers a valuable tool for entities, including corporations, to manage a portion of their operational disaster risk through capital markets. This approach is increasingly applied to address risks such as cyber-attacks. For investors, catastrophe bonds provide several benefits: they typically exhibit low correlation with equity and bond markets, as well as limited exposure to broader economic fluctuations. This low correlation enables investors diversify their portfolios effectively and improve their risk-return profile as they will often deliver higher potential returns compared to other investment options.

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