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UNITED INDIA INSURANCE

Parametric Reinsurance

Abstract

Climate change has significantly changed the risk landscape for insurers, increasing the frequency and severity of natural catastrophe (NatCat) events across geographies. Traditional indemnity-based reinsurance programmes, while effective for large-scale catastrophic losses, often leave insurers exposed to low and medium-intensity events that fall below deductible thresholds. Recognising this protection gap, United India Insurance Company Limited (UIIC) launched India's first Parametric Natural Catastrophe Reinsurance Programme, a pioneering initiative designed to strengthen financial strength through objective, data-driven and rapid-response risk transfer systems. The programme complements conventional reinsurance arrangements through trigger-based payouts linked to measurable parameters such as rainfall intensity, cyclone wind speed, track proximity and seismic ground velocity. Covering four major catastrophe perils, sustained rainfall, torrential rainfall, cyclone and earthquake, the programme protects the portfolio exposure.

Introduction

The insurance industry is progressively confronted with the financial consequences of climate variability and extreme weather events. Floods, cyclones, cloudbursts, earthquakes and severe rainfall events are occurring with greater frequency and intensity, placing substantial pressure on insurers' balance sheets. Traditional catastrophe reinsurance structures have historically been designed to respond to large-scale catastrophic events. However, many recurring low-and medium-intensity disasters remain below treaty deductibles, leaving insurers to absorb losses entirely from their own capital.

The UIIC identified this challenge as a strategic risk to profitability, capital adequacy and sustained viability. The organisation recognised that conventional indemnity-based catastrophe protection mechanisms were insufficient to address evolving climate risks. Consequently, it conceptualised and implemented India's first parametric NatCat

reinsurance programme as a direct reaction to these gaps, designed to operate as a complementary protection layer alongside traditional catastrophe treaties.

Unlike conventional insurance, where claim payments depend upon physical loss assessment and adjustment processes, parametric reinsurance provides pre-defined payouts when objective parameters are triggered. These parameters are derived from measurable indicators such as rainfall accumulation, wind speed, cyclone track distance and seismic activity.

The programme covers multiple portfolios, including Fire, Engineering, Miscellaneous and Motor Own Damage businesses. Supported by advanced catastrophe modelling, historical event back-testing, scientific datasets and strong participation from global reinsurers, the initiative delivers a landmark innovation in Indian insurance risk management.

The Problem Statement Natural catastrophe risks have become increasingly complex and financially consequential for insurers. While catastrophic events attract substantial attention, a significant proportion of losses arise from moderate-intensity disasters that occur more frequently and often remain below traditional reinsurance deductibles. These losses accumulate over time and can materially impact profitability and capital reserves.

Under UIIC's conventional NatCat reinsurance programme, catastrophe events were covered only when losses exceeded a deductible threshold of ₹125 crore per event. Consequently, a substantial portion of low and medium-severity catastrophe losses remained fully retained by the company. Many recurring flood, rainfall and cyclone-related events generated losses significant enough to affect financial condition but insufficient to trigger traditional reinsurance recoveries. In most years, the company's

portfolio losses exceeded recoveries received under the traditional programme, leaving the balance sheet more exposed.

A second challenge concerns claims settlement timelines. Conventional catastrophe recoveries require extensive post-event damage assessment, claim adjustment and verification processes. Such assessments can take several months to yield recoveries, delaying liquidity precisely when insurers need capital support following a catastrophe and slowing the flow of financial relief.

Furthermore, there was a growing need to align catastrophe risk management practices with international insurance standards. Global markets were increasingly adopting data-driven parametric solutions to improve resilience and operational efficiency. For UIIC, developing such capabilities represented both a strategic necessity and an opportunity to pioneer innovation within the Indian insurance sector.

Strategic Vision United India Insurance Company Limited envisioned a future-ready catastrophe risk management framework that could address emerging climate challenges while strengthening financial resilience. The objective was not simply to create an additional reinsurance layer, but to directly address the protection gaps left by traditional structures and to transform how catastrophe protection is structured and delivered.

The organisation sought to bridge protection gaps left by traditional treaties through an objective, transparent and scientifically validated mechanism capable of responding to medium-severity events that typically remained uninsured. At the

same time, the programme was designed to address delayed recoveries, reduce volatility in incurred claims and safeguard capital reserves.

A central element of the vision was the adoption of advanced analytics, catastrophe modelling and globally accepted scientific datasets. By integrating these capabilities into a trigger-based framework, UIIC aimed to establish a scalable platform that could evolve as climate patterns change and emerging risk scenarios emerge. The initiative also reflected a broader commitment to innovation, operational efficiency and sustainable growth while positioning the organisation as a pioneer in modern catastrophe risk management.

Solutions Stack

The Parametric NatCat Reinsurance Programme was designed as a complementary layer operating independently alongside UIIC's traditional indemnity-based catastrophe reinsurance arrangements. The solution merges scientific datasets, catastrophe modelling, exposure mapping and pre-defined payout formulas to create a rapid and objective recovery mechanism that improves financial response after catastrophe events.

At the programme level, the solution provides protection for an insured exposure base of approximately ₹26,468 crore (\$2.9 billion) through an annual recovery limit of ₹150 crore (\$16.7 million). Recoveries are triggered by measurable events rather than assessed losses, enabling settlements within 15 calendar days of lead reinsurer endorsement.

The sustained rainfall cover serves as a proxy for severe and prolonged flooding. The trigger is based on 30-day rolling cumulative rainfall measured at the block level. A linear payout mechanism operates between entry and exit strike thresholds. Rainfall measurements are derived primarily from the India Meteorological Department (IMD) $0.25^\circ \times 0.25^\circ$ daily gridded rainfall dataset, supported by NASA POWER as a backup source.

The torrential rainfall cover addresses flash floods, urban inundation and short-duration high-intensity rainfall events. It uses a three-day rolling cumulative rainfall trigger measured at block level and incorporates a linear payout structure. Like the sustained rainfall cover, it relies on IMD rainfall data with NASA POWER serving as a backup dataset.

The cyclone cover combines two independent parameters: minimum distance from the cyclone track and maximum one-minute sustained wind speed. Payouts are calculated using a wind-distance matrix

that increases recoveries as wind intensity rises along with proximity to the cyclone track decreases. Data is sourced from the International Best Track Archive for Climate Stewardship (IBTrACS) maintained by NOAA, with IMD best-track data serving as a backup.

The earthquake cover is triggered using Peak Ground Velocity (PGV) contours generated through the United States Geological Survey (USGS) ShakeMap system. Blocks intersecting PGV values above 20 centimetres per second become eligible for payouts. This approach delivers an objective measure of ground shaking intensity and enables rapid post-event recoveries without physical damage assessment, supporting faster financial relief after seismic events.

A fundamental innovation underpinning all four covers is the use of block-level, peril-adjusted exposure mapping to derive probable maximum loss proxies. This enables granular geographic risk targeting while preserving the speed and objectivity of parametric settlements.

The solution was developed entirely in-house by UIIC through a structured implementation process involving protection-gap assessment, risk modelling, exposure mapping, trigger design, historical event back-testing, engagement with domestic and international reinsurance markets, programme placement and operational deployment.

Outcomes

The most important achievement is the successful implementation of India's first parametric natural catastrophe reinsurance programme, creating an innovative standard for catastrophe risk management within the domestic insurance sector. By introducing a trigger-based protection mechanism, the organisation has effectively bridged critical protection gaps that existed under traditional catastrophe treaties.

The programme has strengthened financial resilience by reducing volatility in incurred claims and providing an additional recovery mechanism for events that would otherwise remain uninsured. It has improved capital protection and enhanced the organisation's ability to manage recurring climate-related risks.

A major operational advantage lies in the speed of recovery. Unlike conventional catastrophe claims, which may take months to assess and settle, parametric recoveries are designed to be settled within 15

calendar days. This accelerated liquidity significantly improves post-event financial management and strengthens business continuity.

The programme's effectiveness was validated during its first year of operation. Within months of implementation, objective triggers were activated by flood events in Jammu & Kashmir and Uttarakhand, resulting in recoveries calculated directly from IMD rainfall datasets without requiring any physical inspections. Claims were settled within the contractual 15-day timeframe, demonstrating the solution's practical value.

The initiative has additionally strengthened organisational capabilities in catastrophe modelling, climate analytics, as well as data-driven risk management. Integration of datasets from IMD, NASA, USGS, IBTrACS and other authoritative sources has created a robust analytical framework that can support future innovations and programme expansion.

Highlights

- United India Insurance Company (UIIC) launched India's first Parametric Natural Catastrophe (NatCat) Reinsurance Programme, delivering a data-driven, rapid-response approach that strengthens climate risk management and improves financial resilience.
- The programme complements traditional reinsurance by providing trigger-based payouts linked to objective parameters such as rainfall, cyclone conditions and earthquake measures.
- It covers four major catastrophe perils and protects a large exposure base, with an annual recovery limit of ₹150 crore.
- Unlike conventional catastrophe claims that require lengthy damage assessments, payouts are designed to be settled within 15-days, improving post-disaster liquidity and strengthening financial resilience.
- The programme leverages authoritative datasets and advanced catastrophe modelling to support its design and execution.
- Its effectiveness was demonstrated by successful payouts triggered by floods in Jammu & Kashmir and Uttarakhand, with settlements completed within contractual timelines.

Conclusion United India Insurance Company Limited's Parametric NatCat Reinsurance Programme constitutes a transformative innovation in Indian insurance and reinsurance practice. By moving beyond traditional indemnity-based approaches and embracing objective, data-driven triggers, the organisation has created a faster, more transparent and more resilient mechanism for managing catastrophe risks.

The programme successfully addresses long-standing protection gaps associated with low- and medium-intensity catastrophe events while providing rapid liquidity, reducing financial volatility and strengthening capital protection. With protection extending across four major catastrophe perils, coverage supporting ₹26,468 crore of exposure, an annual limit of ₹150 crore and settlements delivered within 15-days, the initiative demonstrates how scientific modelling and technology can fundamentally improve risk transfer systems.

More importantly, the programme establishes a scalable foundation for the future of climate-risk management in India. Its success validates the role of parametric solutions as complementary tools within broader catastrophe protection strategies and positions UIC as a pioneer in building a stronger and innovation-driven insurance ecosystem.



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