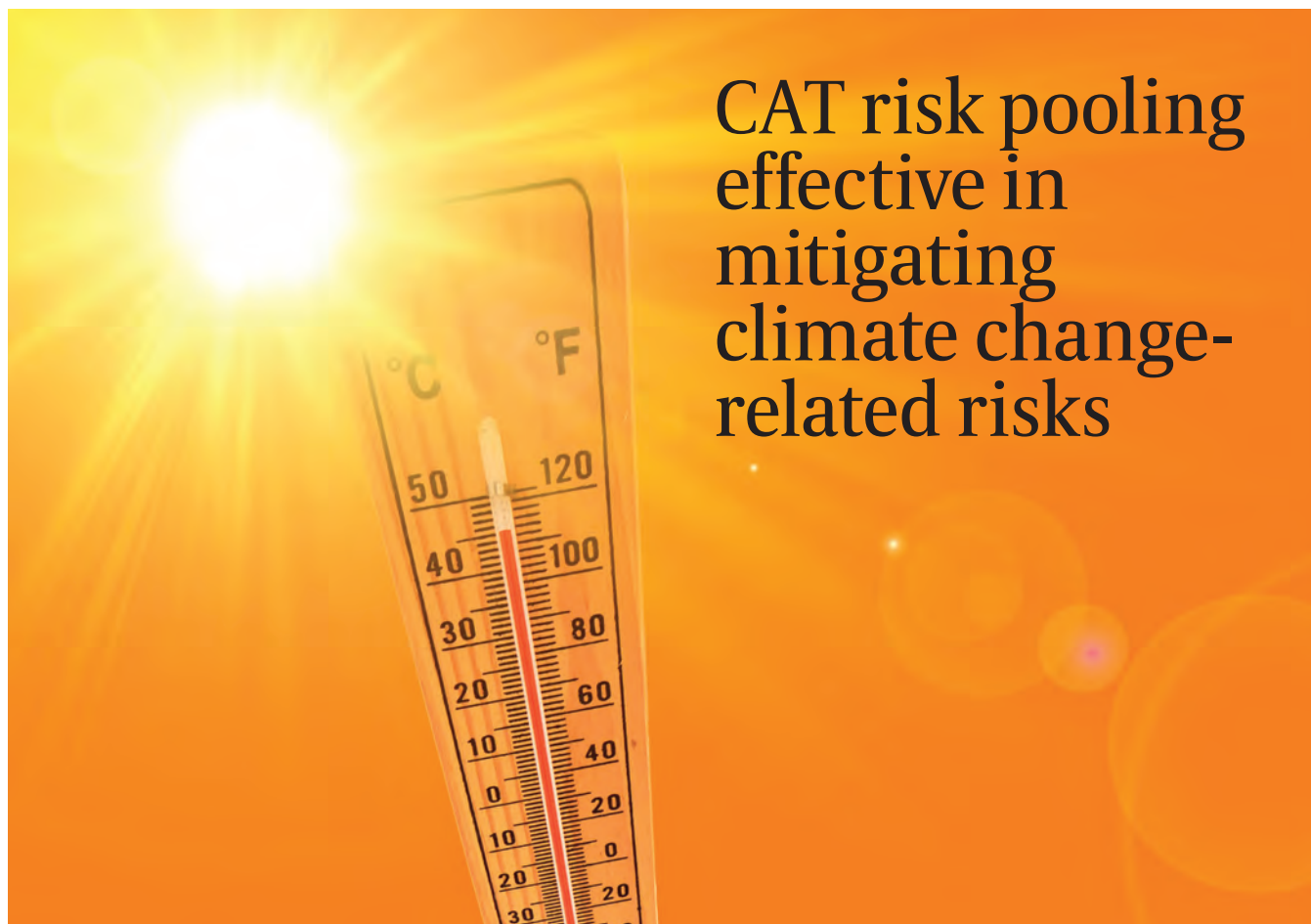


COVER STORY – CLIMATE CHANGE



CAT risk pooling effective in mitigating climate change-related risks

Economically beneficial CAT risk pooling requires an adequate diversification of CAT risks within a particular insurance pool, both in terms of geographies and perils, says

Mr Andreas Bollmann
of **Faber Consulting**.



Climate change has increased the frequency and severity of extreme weather events across the globe. Natural disaster losses – especially those due to extreme weather – are on the rise. The gap between economic and insured weather-related disaster losses is widening further, exacerbating the problem.

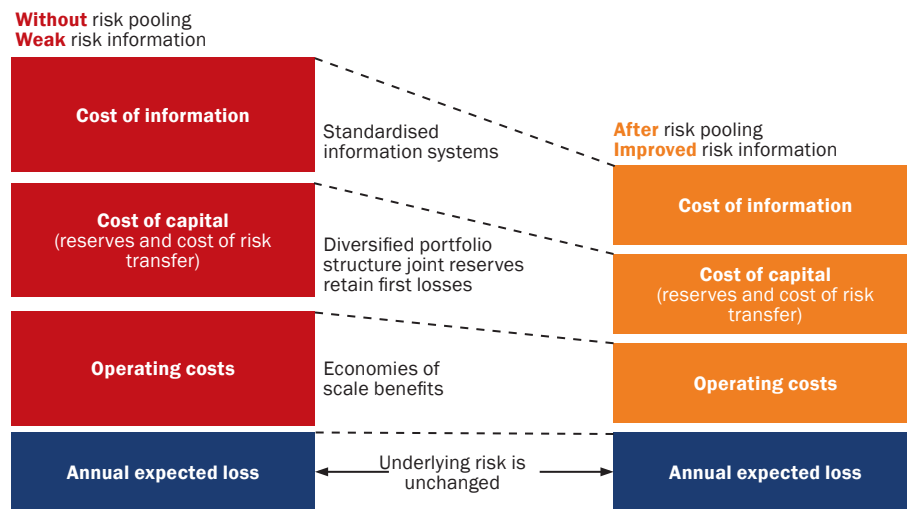
While over the course of the years 2008 to 2018 the average annual economic losses amounted to \$164bn, on average insurance only covered about \$61bn annually thereof, according to Munich Re's NatCatSERVICE. In the low- and lower-middle-income countries, in the same period, less than 5% of weather-related losses were insured, questioning the relevance of (commercial) insurance to mitigate the effect of disasters.

The Middle East and Africa are particularly exposed to the effects of climate change. The interplay of natural disasters, water scarcity, rapid urbanisation, and climate change has emerged as a serious challenge to regional policymakers. Moreover, the Middle East is already the most 'food import-dependent in the world' and more than one third of all basic foods travel through either the Suez Canal, the Turkish Straits, the Strait of Hormuz and the Strait of Bab al-Mandab.

Coverage remains insufficient

As outlined in a report published by the Society of Actuaries (SOA) in late 2019, damages arising from climate change and extreme weather not only pose threats to human lives, livelihoods and health, but they also severely impair socio-economic growth and development through direct damage to assets such as infrastructure and buildings, as well as by causing indirect costs due to business interruption, loss of jobs and reduction in tax revenues. Certain regions are confronted with the elevated risk of uninsured catastrophic property losses as insurance coverage remains insufficient.

This growing mismatch is apparent in both mature and developing economies. In the US, for example, highly susceptible regions not considered

Figure 1: How insurance premiums benefit from risk pooling and improved risk data

Source: World Bank (2017)

privately insurable may be covered for certain damages through a policy with the National Flood Insurance Program. Outside of the US, insurance availability and penetration vary considerably. In many small and low-income nations, virtually all economic disaster losses remain uninsured. These countries are dramatically ill-equipped to manage looming CAT risks, with potentially crippling effects on their economies and societies.

Countries in Africa, the Caribbean and the Pacific have always been particularly exposed to extreme weather events such as hurricanes, droughts and floods. But in recent years, this exposure has increased further on the back of population growth, urbanisation dynamics, overexploitation of natural resources, environmental degradation and changing climate and weather patterns. More than ever before, Nat CATs threaten national development strategies and, more important, millions of lives and livelihoods.

Pooling schemes to mitigate the impact from Nat CATs

Building on mature markets' experience with public and private-public pooling schemes, some of the most vulnerable countries in emerging markets have joined forces. Supported by development agencies and donors, they pool their scant financial resources in regional risk-sharing vehicles. The best-known examples are the Caribbean Catastrophe Risk Insurance Facility (CCRIF), established in 2007, the African Risk Capacity (ARC), set up in 2012 and the Pacific Catastrophe Risk Assessment and Financing Initiative Facility (PCRAFI Facility), launched in 2016. In exchange for an annual premium, these facilities offer participating countries limited payouts designed to cope with the immediate aftermath of major disasters. The payouts cover public expenditures for disaster-related emergency and relief measures, rather than large-scale reconstruction measures.

The policy objectives underlying these sovereign schemes exhibit major differences. The ARC is primarily an insurance risk pool committed to enhancing food

security and efficiently protecting the livelihood of low-income people, capitalising on the natural diversification of weather risk across Africa. The PCRAFI, by contrast, places significant emphasis on facilitating a dialogue between the participating countries on integrated financial solutions to reduce their financial vulnerability to natural disasters and to climate change.

To a lesser extent, this wider remit is also characteristic of the CCRIF, which aims to strengthen regional resilience through optimised disaster risk management and climate change adaptation practices, assisting governments and their communities in understanding and reducing the socio-economic and environmental impacts of Nat CATs. Having said this, the most striking feature is the different approaches to the use of payouts: Whereas CCRIF and PCRAFI were designed to help cover post-disaster contingent government liabilities and fiscal cash shortages, ARC aims to mitigate drought-induced famines and to ensure food security among the poorest segments of the population.

Risk pooling is essential to the concept of insurance

According to the law of large numbers, the larger the number of exposure units independently exposed to losses, the greater the probability that the actual loss experience will be close to the expected loss experience. Against this backdrop, insurers seek to pool independent risks and aggregate the individual risk exposures. In the CAT space, however, the covariant nature of risk removes the intrinsic advantage of insurance based on the aggregation of independent risk. Economically beneficial CAT risk pooling, therefore, requires an adequate diversification of CAT risks within a particular insurance pool, both in terms of geographies and perils.

As illustrated in Figure 1, risk pooling can be an effective tool for reducing the technical risk premium, thereby enhancing the efficiency of risk transfer. More specifically, the following economic benefits can be captured:

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- **Reduced cost of capital:** The pooling of reserves improves the pool members' ability to retain the first aggregate loss. In addition, based on a better structured and diversified portfolio, the cost of reinsurance and risk transfer in general decreases. Over time, CAT risk pools can also accumulate surplus (equity) capital which improves the pool's risk retention capability and reduces its dependency on global reinsurance and capital markets for risk transfer.
- **Lower operating costs:** Shared fixed costs enable economies of scale.
- **Lower uncertainty loadings:** A larger and more diversified risk portfolio translates into lower overall volatility and uncertainty.

The setting of the risk retention level and the total claims paying capacity mainly depend on regulatory requirements, the risk appetite of the management, the cost of capital and access to finance. A higher risk retention level translates into lower reinsurance costs for the pool and, as a result, lower premiums for participating countries, thereby addressing one of the biggest concerns of low-income countries: the affordability of premium payments. Smaller developing countries in particular often encounter difficulties to fund premiums. As a consequence, prior to establishing new pooling schemes, decision-makers should carefully examine alternative funding structures such as contingent loan arrangements, both under normal operating and under stress scenarios.

In addition, it is important that CAT pools are providing the right incentives for individual countries and organisations to adopt risk mitigation and prevention measures.

Building a comprehensive risk management strategy

Building on this approach, climate risk insurance and disaster risk finance are most effective when embedded in a country's comprehensive risk management strategy,

aiming to avoid negative impacts as far as possible in the first place. The United Nations Development Programme (UNDP) estimates that every dollar invested into disaster preparedness saves seven dollars in disaster aftermath. Nevertheless, only 1% of international aid is currently spent to minimise the impact of these disasters. Therefore, it is essential that the CAT pool arrangement offers explicit risk premium discounts to reflect the effects of risk mitigation and prevention, thus providing the right incentives for individual countries and organisations to adopt risk mitigation and prevention measures.

Retained earnings, asset growth and an increasing net worth are essential elements of the CAT pool's sustainability and long-term value creation. Over time, the CAT pool needs to have a reasonably high probability of accumulating 'capital reserves' to be able to retain more risks within the pool, thus reducing the future cost of reinsurance. Most CAT pooling schemes around the world have been established as non-profit risk-taking entities with no obligations to return profits in the form of dividends to its shareholders/owners. A CAT pool in a healthy financial condition is also more likely to retain participating members and attract professional staff to administer the CAT pool.

Generally speaking, and as demonstrated in the SOA report from 2019, the establishment and capitalisation of dedicated regional risk pooling schemes has proven effective, in particular for low-income countries which are highly exposed to extreme weather events. In early 2020, the Indian state of Nagaland was the latest member joining the group of sovereign and sub-sovereign policyholders that have decided to assess global reinsurance markets to transfer some of their weather risk-related contingent liabilities. [M](#)

Mr Andreas Bollmann is founding partner at Faber Consulting. With more than 20 years of global reinsurance experience, his current focus is on underwriting, financial analysis as well as strategy development and implementation. He is the co-author of the SOA report on Catastrophe Risk Pooling and recently provided natural catastrophe risk management consultancy services to the Government of Nagaland.

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