

# MITIGATING FLOOD RISK IN ASIA

Asia poses specific challenges in the mitigation of flood risk. Land subsidence, insufficient storm water infrastructure, data paucity and low insurance penetration are just some of the issues facing the region. **Dr Markus Stowasser** and **Ms Katherine Wenigmann** from **Allianz Re Nat CAT Research and Development** give an update on managing this risk.



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**W**ith booming coastal megacities at increasing risk from rising seas and flood events and many of these located in the region, it is easy to see why Asia is expected to account for 50% of all global assets exposed to flood risk by the year 2070.

One of the most important tools in mitigating flood risk is models and their simulations. These form the basis for many risk and pricing decisions taken by the industry. However, in order to be accurate, the models rely on data that is sufficiently accurate, current and granular. Obtaining such data in the quality and quantity required is not always a straightforward matter.

## Flood hazard maps

For several years, Allianz Re has worked with flood maps provided by a large external provider. These flood hazard maps are intersected with internal and external portfolios, to build an overall risk picture.

The geocoding of insured assets is particularly important for flood risk, because flood events are so geographically specific. A property located at the bottom of a hill can be in much greater risk than one a short distance away, but elevated.

Earthquake and storm risks are much less precise. Using geocoding in this way allows for better pricing, better knowledge of the risk and the ability to avoid risk accumulation in hot spots – which in turn allows more portfolio diversification.

## Information of assets not easily available

But assets in Asia can prove challenging to geocode, since the



precise asset address required is often unobtainable. Street names and numbers are not as strictly defined in parts of the region, meaning sometimes the models have nothing but a postal code to work with. Additional information such as year of construction, building material and construction design can be similarly difficult, reducing the effectiveness of the sharpest flood risk mitigation tool in the insurance armoury.

In addition to this, the models are already dealing with many variables. Floods can occur as a result of a river rising and breaching its defences, as a result of flash-flooding, or because of storm surges. Mitigation measures such as dams, dykes and levees hold out for varying periods and are crucial for estimating the loss potential in the models.

## Storm water and drainage systems

The issue of storm water and drainage systems also poses an increased flood risk in parts of Asia, where the infrastructure has struggled to keep pace with rapid expansion and development.

When flood water has nowhere to disperse to and no adequate drainage is available, the effects are much longer-lasting and more severe.

This can be an issue even in the most developed nations, as highlighted by the GBP5.7 billion “Thames Tideway Tunnel”, a project led by Allianz and an international consortium of investors, to refresh London’s struggling sewer infrastructure.

Projects such as this in Asia would help mitigate the situation. Reports suggest average annual economic losses

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requires a more complex solution than simply stopping – a new source for the essential water is required before the practice can be phased out.

Demographics pose one of the largest challenges to flood risk mitigation in Asia. Six of the world's most populous megacities are located in the region, with many of these coastal settlements at increased risk of exposure to natural catastrophes and flooding due to climate change. Globally, over one billion people live in low-lying coastal areas at risk of flooding.

## COP21 – Insurance industry and risk assessment emphasised

The recent COP21 (Conference of the Parties – the UN Framework Convention on Climate Change) held in Paris reached a landmark agreement for managing climate change among the 195 attendant countries.

My colleague Karsten Löffler, Managing Director of Allianz Climate Solutions, attended the conference and notes the emphasis the insurance industry received in the wording of the final agreement. It calls for the establishment of “a clearinghouse for risk transfer that serves as a repository for information on insurance and risk transfer, in order to facilitate the efforts of [countries] to develop and implement comprehensive risk management strategies.”

“In such a framework,” Löffler said, “insurance is not solely a tool that organises financial risk, collects premiums, and makes payouts. Risk assessment is a core function of insurance approaches. It brings attention to the hazard potential, the exposure and vulnerability, and in this way it can raise awareness and expose new options for managing the risks.”

The prerequisites of insurance – including hazard maps and risk information; appropriate regulation, building codes and zoning, and consumer protection; and financial adequacy – can catalyse the anticipation and management of adverse climate impacts.

Such an explicit mentioning of insurance is surprising and a signal achievement; an indication that both developed and developing countries see high potential in expanding insurance.

## Low level of insurance penetration in Asia

This is heartening given the relatively low level of insurance penetration in the Asia region. Munich Re reported that “for every euro of destruction caused by a natural catastrophe in Asia, on average only eight cents was covered by insurance during this period [1980-2012], while the average for the same period was 40 cents on the American continent.”

Of the \$168 billion global insurance shortfall, the majority rests in Asia. China, poised to become the world's largest economy, has one of the biggest insurance shortfalls in the region with 90% of the total loss per Nat CAT event between 2004 and 2011 recorded as uninsured.

## Joint effort between financial industry and governments required

As markets open up and trade barriers are liberalised, it is critical for insurers to position products that meet these new consumer needs.

Initiative must also come from governments, with the Asia Development Bank encouraging those regions to make disaster risk financing a “key policy priority”. It favours an ex-ante disaster risk financing approach which would see capacity to pay for Nat CATs secured before they occur.

This involves a blend of insurance and reinsurance measures as well as capital market risk transfer tools, such as catastrophe bonds. Swiss Re's *Sigma* agrees: “Risk transfer can protect livelihoods from catastrophic events and increase the willingness of decision-makers to invest in economic development. Additionally, risk transfer puts a price tag on risk and thereby incentivizes investments in prevention measures.”

The same joint effort between financial industry and governments is required to improve and standardise data input on assets to be insured. Information both broad and detailed, such as that provided through geocoding, will support appropriate modelling and risk assessment on which the industry can build risk-adequate products and solutions for regions threatened by flood-risks. ■

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from Asian flood disasters could surge to US\$500 billion or more by 2050 if no additional investments in adaptation are made, compared with average annual global flood losses of about \$30 billion between 2004 and 2013.

## Sinking land

Land subsidence presents another challenge in parts of Asia, and can result in larger flood areas which remain longer and submerge cities deeper.

China Water Risk reports that around 50 cities in China are at heightened flood risk due to land subsidence, and the Deltares Research Institute warns that parts of Jakarta, Ho Chi Minh City, Bangkok and other coastal cities will sink below sea level unless action is taken.

While part of the issue stems from the increasing pressure of buildings on ground level, it is primarily caused by the extraction of groundwater – a practice that saw Tokyo sink two metres before it was stopped.

However, mitigating this risk is not simple. Since the groundwater is often used as drinking water, the issue