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RE-Konnect

Risk Engineering Bulletin

December 2017 Vol. 2 | Issue 2

In Focus:

Floods

Did You Know?

Interesting facts on Flood

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Disastrous floods in India

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Engage

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Preface

In the previous issue we discussed how Tropical Cyclones\Hurricanes can lead to floods and cause widespread damage. Floods can also be caused by excessive precipitation, snow melt or high tide. As a follow-up to the discussion in previous issue, in this issue we will further explore the aspects of flooding phenomenon.

India is one of the highly flood prone countries in the world. More deaths each year occur due to floods than from any other thunderstorm-related hazard because people underestimate the force and power of water. Many of the deaths occur in automobiles that are swept downstream. Floods cause damage to houses, industries, public utilities and property resulting in huge economic losses, apart from loss of lives. In this issue of RE-Konnect, we provide you a brief overview on Floods and the various flood related losses seen over years. There are several overlaps in the loss prevention strategies between cyclones and floods and hence a separate discussion on this is not presented here. For loss prevention measures the reader is requested to refer to the previous RE-Konnect issue on Tropical Cyclones.

Did You Know?

- China has experienced 6 out of 10 deadliest floods of all time.
- The term 'monsoon' comes from the Arabic 'mausim' that means season or a shift in wind.
- Floods are often deadly but they also bring some benefits, such as recharging of ground water and making soil more fertile.
- Depending on their type, floods can develop very slowly over time after extensive rains or in just a few minutes, very quickly, without any sign of rain.
- The *return period* is the inverse of the expected number of occurrences of an event in a year. For example, a 50-year flood has a $1/50 = 0.02$ or 2% chance of being exceeded in any one year. This does not mean that a 50-year flood will happen regularly every 50 years, or only once in 50 years. In any given N-year period, a N-year event may occur once, twice, more, or not at all.
- India often experiences the most dramatic monsoons in the world. The 2005 monsoon was so strong that over 1,100 lives were lost!
- Weather forecasting, which includes precipitation, once used to be a human only endeavor has evolved over the time to include complex computer-based models. US has been consistently spending more than 5 billion dollars each year on weather forecasting in the recent times.

Disasters

While natural topography and excessive rainfall are obvious causes, flood situations are further worsened by human intervention—like encroachment of river banks and wetlands, lack of drainage, unplanned urban growth, hill cutting and deforestation. Below are the some of the fiercest disasters due to floods in India:

North India Flood, 2013

In June 2013, a multi-day cloudburst on the North Indian state of Uttarakhand caused devastating floods and landslides becoming the country's worst natural disaster since the 2004 tsunami. The reason the floods occurred was that the rainfall received was on a larger scale than the regular rainfall the state usually received. The debris blocked up the rivers, causing major overflow. Though some parts of Himachal Pradesh, Haryana, Delhi and Uttar Pradesh in India experienced the flood, some regions of Western Nepal, and some parts of Western Tibet also experienced heavy rainfall, over 89 % of the casualties occurred in Uttarakhand. According to figures provided by the Uttarakhand government, more than 5,700 people were presumed dead. This total included 934 local residents.

South India Floods, 2015

From October to December each year, a very large area of south India, including Tamil Nadu, the coastal regions of Andhra Pradesh and the union territory of Puducherry, receives up to 30 percent of its annual rainfall from the northeast monsoon (or winter monsoon). The northeast monsoon is the result of the annual gradual retreat of monsoonal rains from northeastern India. The 2015 South Indian floods resulted from heavy rainfall generated by the annual northeast monsoon in November–December 2015. They affected the Coromandel Coast region of the South Indian states of Tamil Nadu and Andhra Pradesh, and the union territory of Puducherry, with Tamil Nadu and the city of Chennai particularly hard-hit. More than 500 people were killed and over 18 lakh people were displaced. With estimates of damages and losses ranging from nearly US\$3 billion to over US\$16 billion, the floods were the costliest to have occurred in 2015, and were among the costliest natural disasters of the year. The flooding has been attributed to the 2014-16 El Niño event.

Assam Floods, 2017

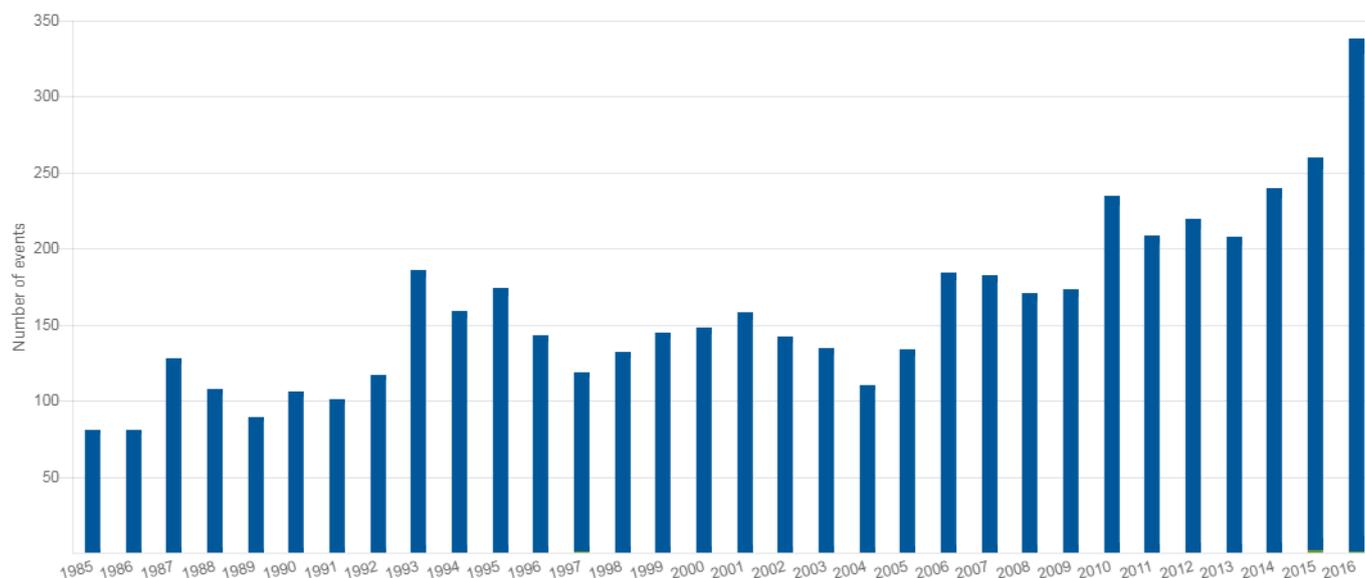
The Brahmaputra, a trans-boundary river and among the mightiest rivers in Asia, is braided and unstable in its entire reach in Assam except for a few places. Year after year, the biggest state in the northeastern region, Assam, is ravaged by floods. It displaces thousands and damages property worth billions—but lessons are rarely learnt. According to data released by the Assam State Disaster Management Authority (ASDMA), 2017 has been the worst of the last four years in terms of floods.

In 2014, due to floods, 1,846 villages were affected and about 1.6 million people were displaced. In 2015, the number of affected villages was 1,031 and about 1.5 million people were displaced. The numbers saw a huge jump in 2016 with 2,893 villages affected and about 1.7 million people being displaced. This year, about 2,450 villages have been already affected by floods and more than 1.7 million people displaced.

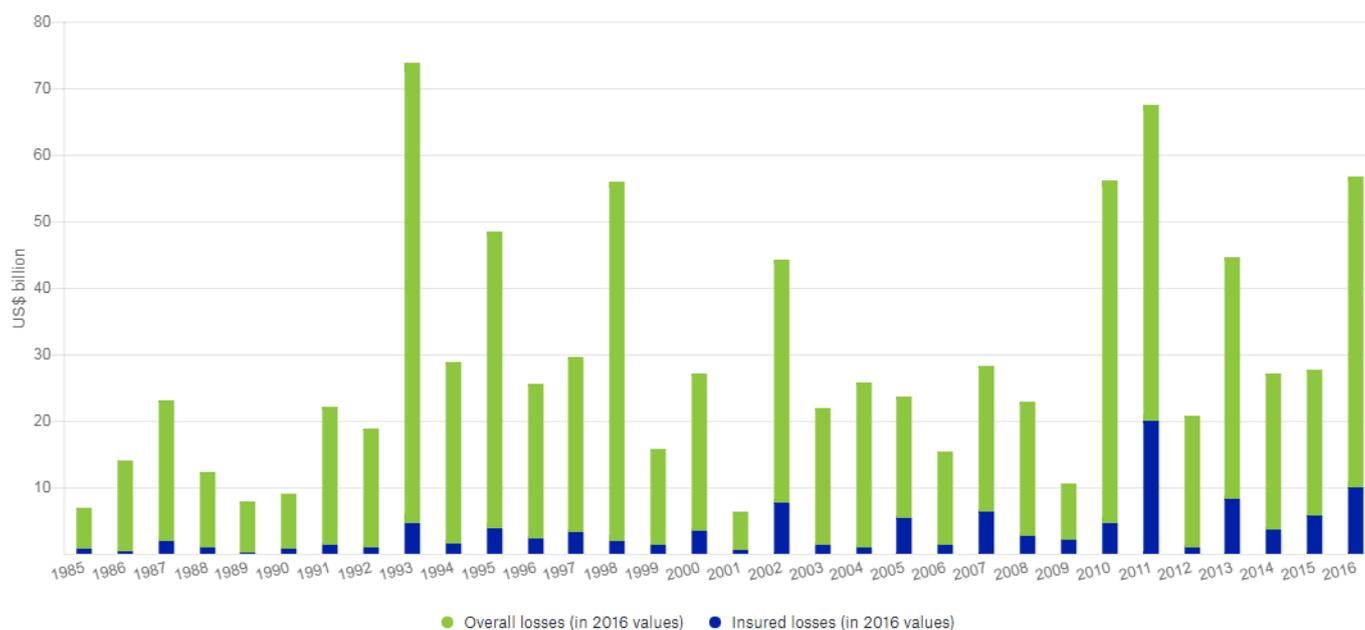
Flood in Numbers

The following chart shows the number of flood events from 1985 to 2016*. There have been increasing incidences of worldwide flood events. The second chart shows the overall and insured losses during the same period (in 2016 US dollar values). Despite increasing number of flood events the ratio between insured losses to the overall losses has seen only marginal improvements.

Number of flood / flash flood events worldwide 1985 - 2016

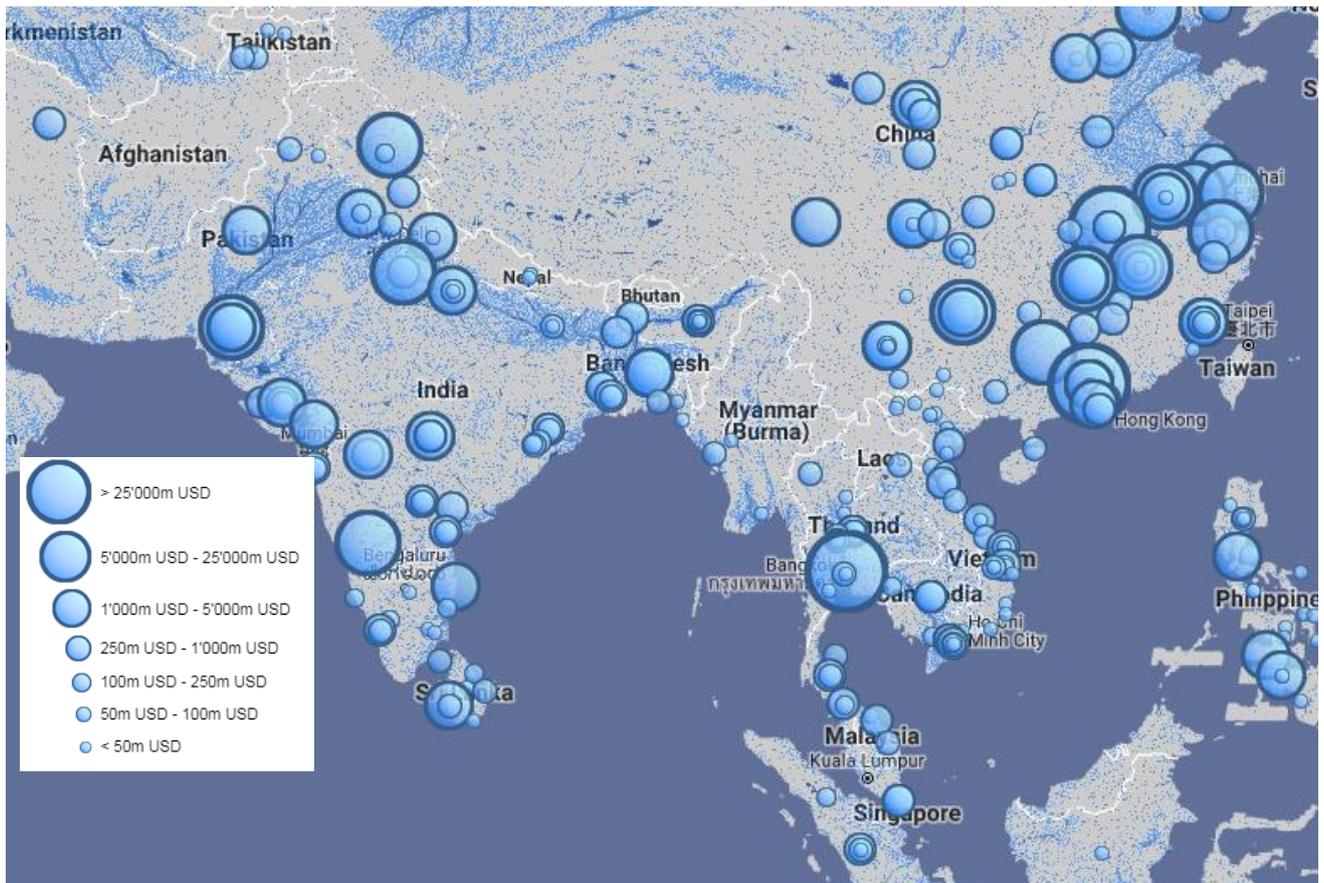


Overall and insured losses in US\$ for flood / flash flood events worldwide 1985 - 2016



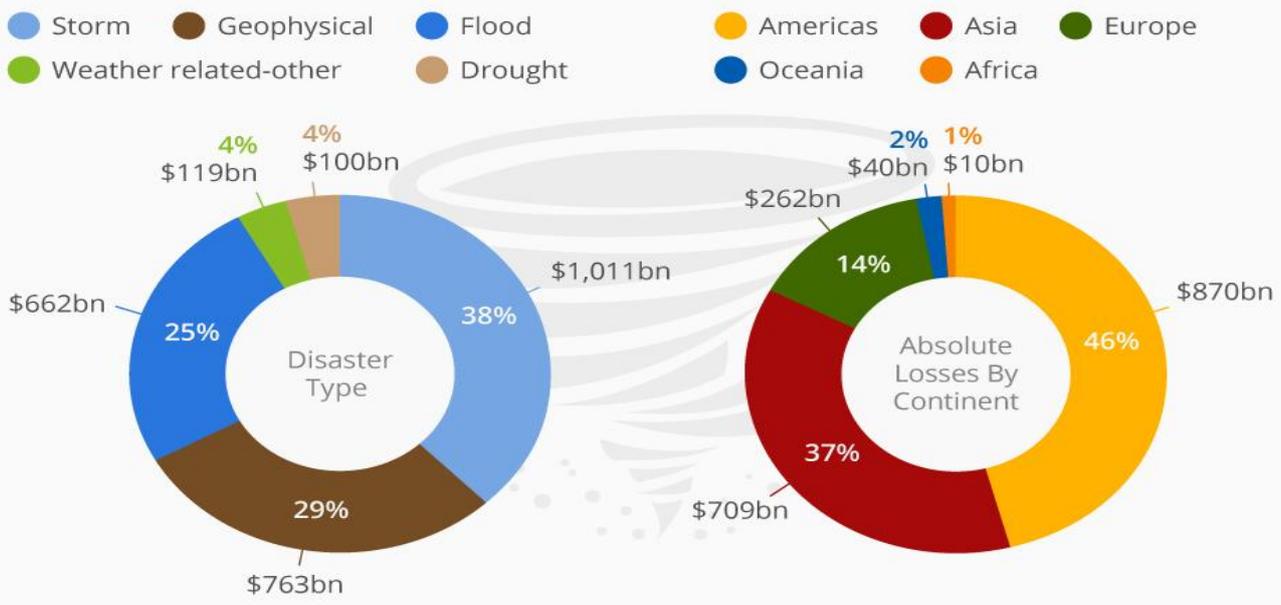
* Source: Munich RE NatCatSERVICE

The below map shows flood related economic losses in south-east Asia region†. Size of the bubble is proportional to the size of the economic loss.



The Natural Disasters That Inflict The Most Economic Damage

Economic damage by disaster type and region from 1995 to 2015



† Source: Swiss Re CatNET

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New Orleans, Louisiana, in the aftermath of Hurricane Katrina

To download previous issues of the bulletin, please visit the following link:

<https://www.tataaig.com/PropertyEnergyLossPrevention>

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