



Earth



1943

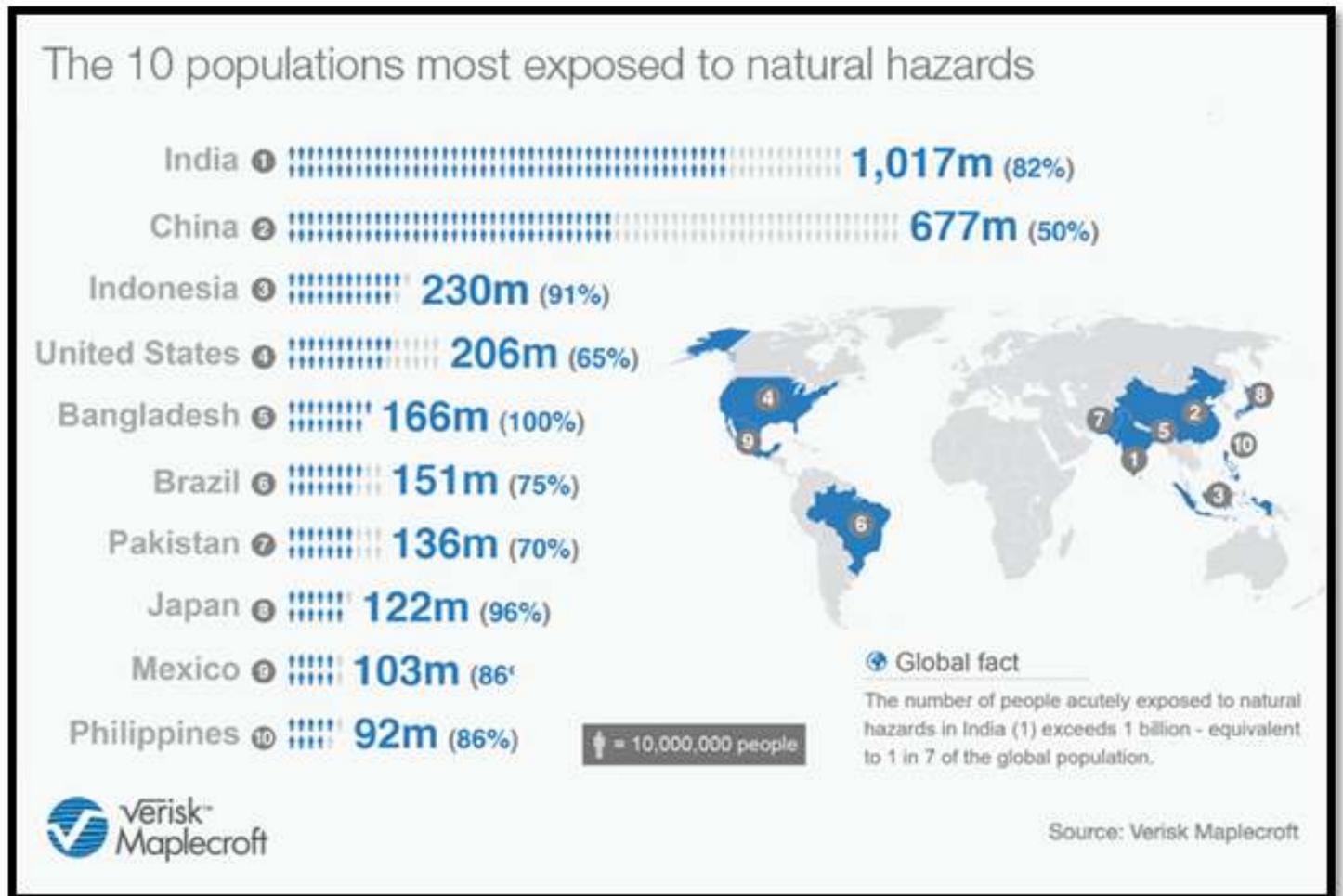
J. B. BODA

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India Most Exposed to Natural Hazards

A recent study by Verisk Maplecroft revealed that 1.4 billion people in South Asia - 81% of the region's population - are exposed to at least one of natural hazards and live in areas considered to have insufficient resources to cope with and rebound from an extreme event.

Verisk Maplecroft assessed the risks posed by 11 types of natural hazards, including tropical cyclones, floods, winter storms, earthquakes, wildfires, and tsunamis in 20 new risk indices covering 198 countries. The study found that more than 1 billion people in India - as shown in chart below - are exposed to natural hazards.



The study identifies flooding as one of the most substantial risks to communities and business in South Asia. In India alone, 113 million people, or 9% of the population, are acutely exposed to flood hazards. Indeed, heavy monsoon rain in November-December 2015 sparked record flooding in South India, which cost the country upwards of US\$3 billion and displaced more than 100,000 people. Insured losses were around INR 5,000 crores (USD 755 million, ROE: 1 USD = 66.1783 INR).

Among the most exposed cities, 8 are from Asia and, within those 8, 2 are from India. People of New Delhi and Kolkata are more vulnerable. Earthquakes and floods can hit New Delhi; while, cyclones, earthquakes, and floods can be catastrophic for Kolkata. Both cities, being center of commercial and industrial activities as well as metropolitan, might experience humongous losses – both insured and economic should any disaster strikes. (BMTPC)

The study found that 1) Poor governance, 2) Weak infrastructure, 3) High level of poverty and corruption amply losses caused by natural hazards. In addition, inability to judge consequences of haphazard, short-term planning, poor implementation of construction codes, and lack of co-ordination among various agencies further worsen the situation.

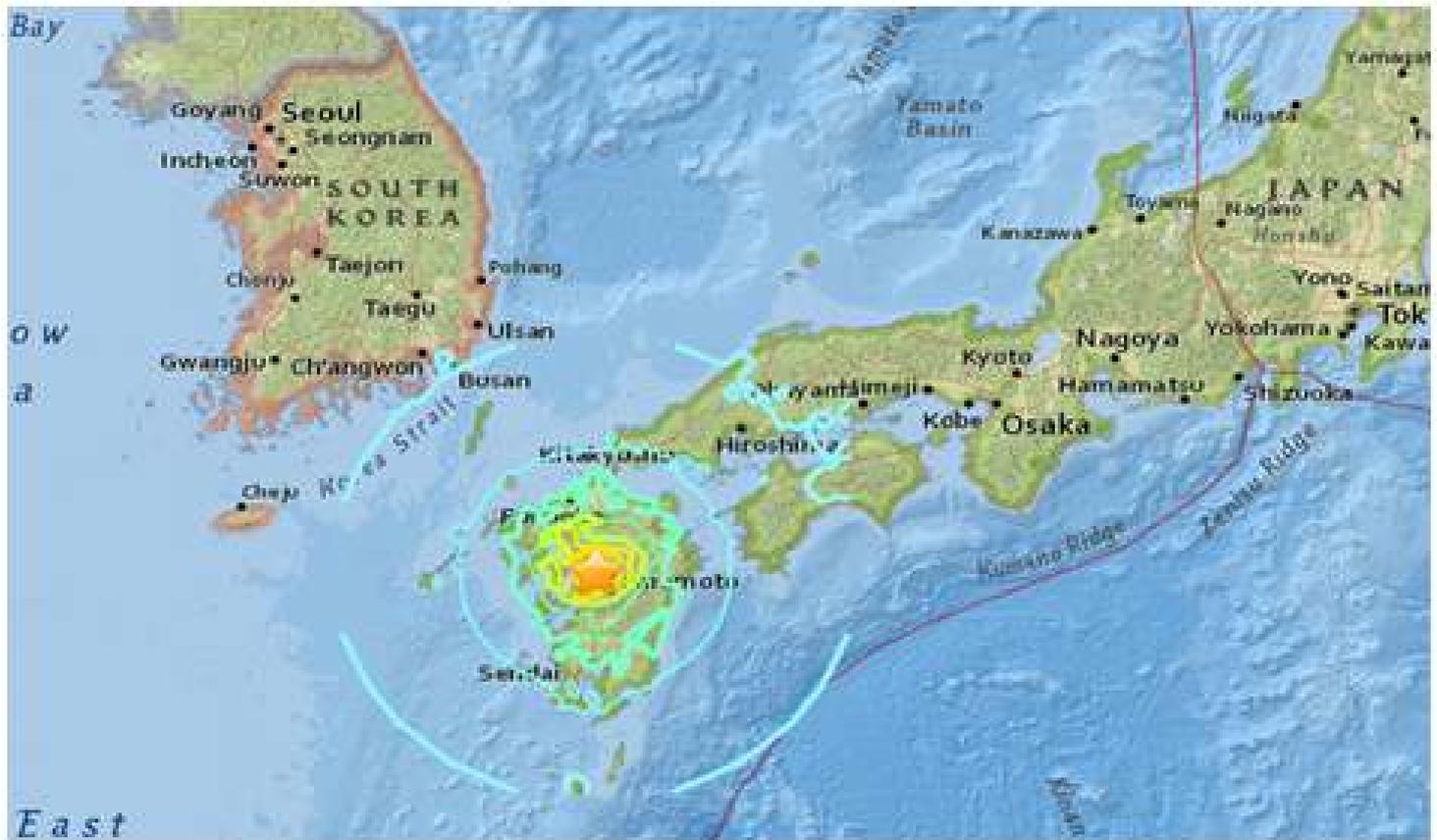
Source: Verisk Maplecroft, BMTPC

Severe Earthquakes Occur in Japan and Ecuador

Japan

A powerful earthquake with magnitude Mw 7.0 with focal depth of 10 kilometers (6.2 miles) struck Kumamoto region on island of Kyushu early morning of 16 April 2016 (UTC 16:25:06).

It occurred as the result of strike-slip faulting at shallow depth and came after series of foreshocks in the same region, which included M 6.2 and M 6.0 earthquakes.



Town of Mashiki was hit the hardest. The latest quake also appeared to have triggered a small eruption of the Mt Aso volcano on Kyushu. The Japanese Meteorological Agency kept its alert level at 2 on a scale of 5 for the volcano.

Cat modeling firms RMS and AIR have released their preliminary estimates of loss numbers. According to RMS, economic property damage for both the April 15 moment magnitude (Mw) 7.0 earthquake and April 14 Mw6.4 earthquake in Japan's Kumamoto Prefecture to be between USD 2.5 - 3.5 billion. This includes damage to property and contents for residential, commercial, and industrial buildings but excludes damage due to business interruption, shake and landslide-induced damage to infrastructure (roads, highways, bridges, airports, train transport, utilities, dams), or damage to Kumamoto Castle.

The RMS reconnaissance team observed:

- The principal areas of damage are to the towns of Nishihara-mura, Minamiaso-mura, and Mashiki-machi.
- The area has a local river network and hilly terrain where landslides or slope failures were triggered in some locations causing localized pockets of damage.
- Buildings located up-slope from small landslides were relatively undamaged or suffered light damage, whereas buildings on or beneath affected slopes experienced moderate to complete damage.
- Nearly all buildings that collapsed or had partially collapsed on the slope or the area beneath it were within close proximity of each other.

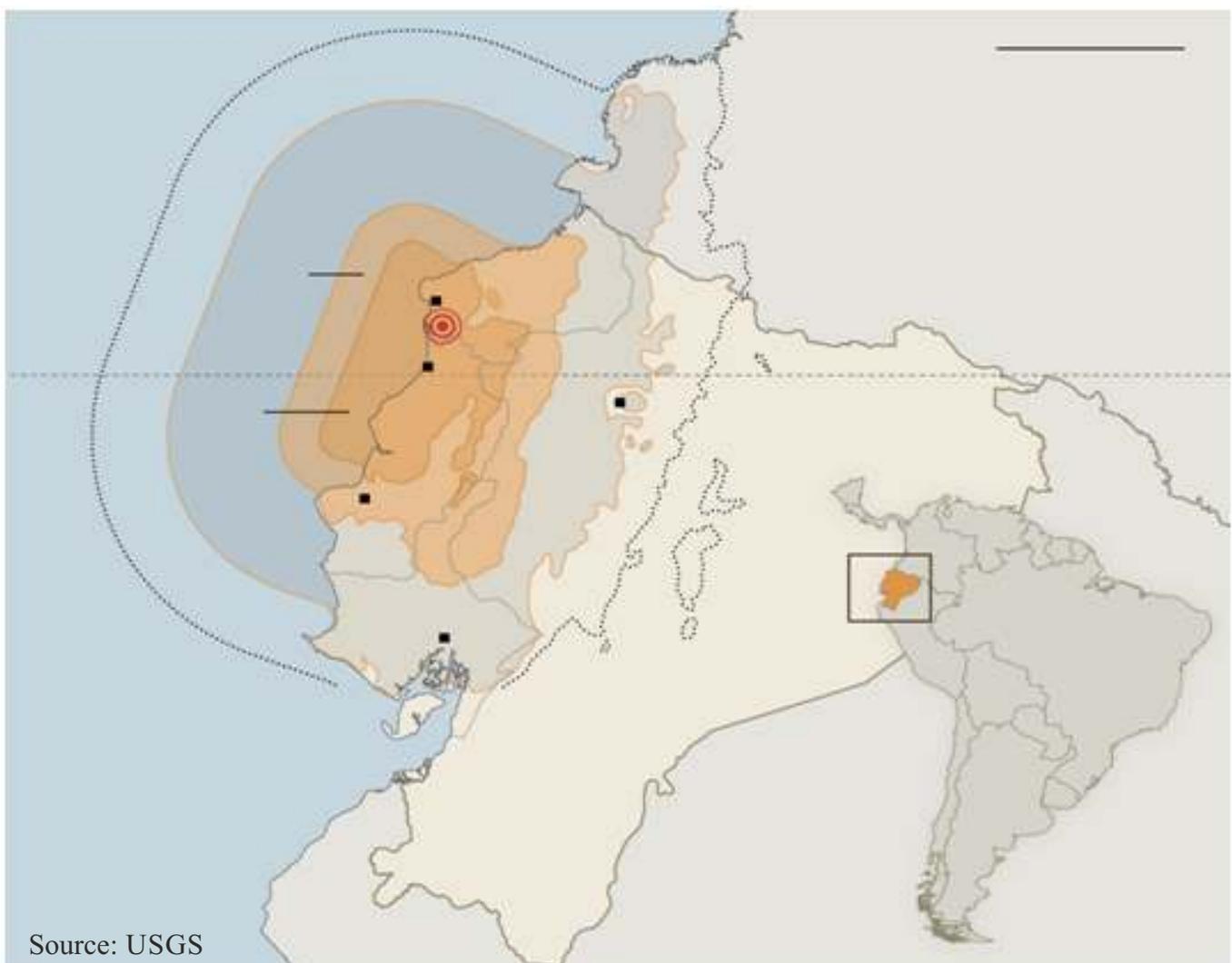
- Evidence of soft story failures (for example in stories with less strength due to extensive glazing, wide doorways or other openings) was observed in some buildings with older construction, in addition to pounding (impacts) between neighboring properties, which caused damage across multiple adjacent buildings.
- Older mixed-use buildings were seen to have sustained damage or in some cases suffered complete collapse because they were inadequately constructed to withstand lateral (sideways) forces.
- Older, traditional residential dwellings were found to be particularly susceptible to ground shaking and slope conditions.

AIR estimated that insured losses to properties from the April 16 M7.0 earthquake that struck Kumamoto Prefecture on Japan's Kyushu Island will be between JPY 180 billion (USD 1.7 billion) and JPY 320 billion (USD 2.9 billion).

Ecuador

An earthquake of magnitude 7.8 hit the offshore of the west coast of northern Ecuador in early evening on Saturday April 16, 2016 (23:58 UTC) near the coastal town of Muisne. The earthquake, strongest since 1979, occurred as the result of shallow thrust faulting on or near the plate boundary between the Nazca and Pacific plates. Some geologists said its force was 20 times greater than the deadly earthquake that struck southern Japan early Saturday April 16, 2016.

Ecuador has a history of large subduction zone related earthquakes. Seven magnitude 7 or greater earthquakes have occurred within 250 km of this event since 1900. On May 14, 1942, a magnitude 7.8 earthquake occurred 43 km south of this April 16, 2016 event. On January 31, 1906 a M 8.3 earthquake (reportedly as large as M 8.8 in some sources) nucleated on the subduction zone interface 90 km to the northeast of the April 2016 event, and ruptured over a length of approximately 400-500 km, resulting in a damaging tsunami that caused in the region of 500-1,500 fatalities. The April 2016 earthquake is at the southern end of the approximate rupture area of the 1906 event. A shallow, upper crustal M 7.2 earthquake 240 km east of the April 2016 event on March 6, 1987 resulted in approximately 1,000 fatalities. The effects could be felt in the capital, Quito, and into parts of Peru and Colombia.



Source: USGS

The Government of Ecuador estimated that quake inflicted \$2 billion to \$3 billion of damage to the oil-dependent economy and could knock 2 to 3 percentage points off growth.

According to AIR, insured losses from the M7.8 earthquake that struck Ecuador's central coast on April 16 will be between USD 325 million and USD 850 million. These losses include a) Insured physical damage to onshore property (residential, commercial/industrial), both structures and their contents, and auto; b) Direct business interruption losses.

Source: *USGS, RMS, Reuters, New York Times, BBC, and AIR*

For more details email us at: earth@jbbodagroup.com

Address: J. B. Boda Reinsurance Brokers Pvt. Ltd. Maker Bhavan No. 1, Sir Vithaldas Thackersey Marg,
Mumbai 400 020, India | Phone :+91-22-6631 4949

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