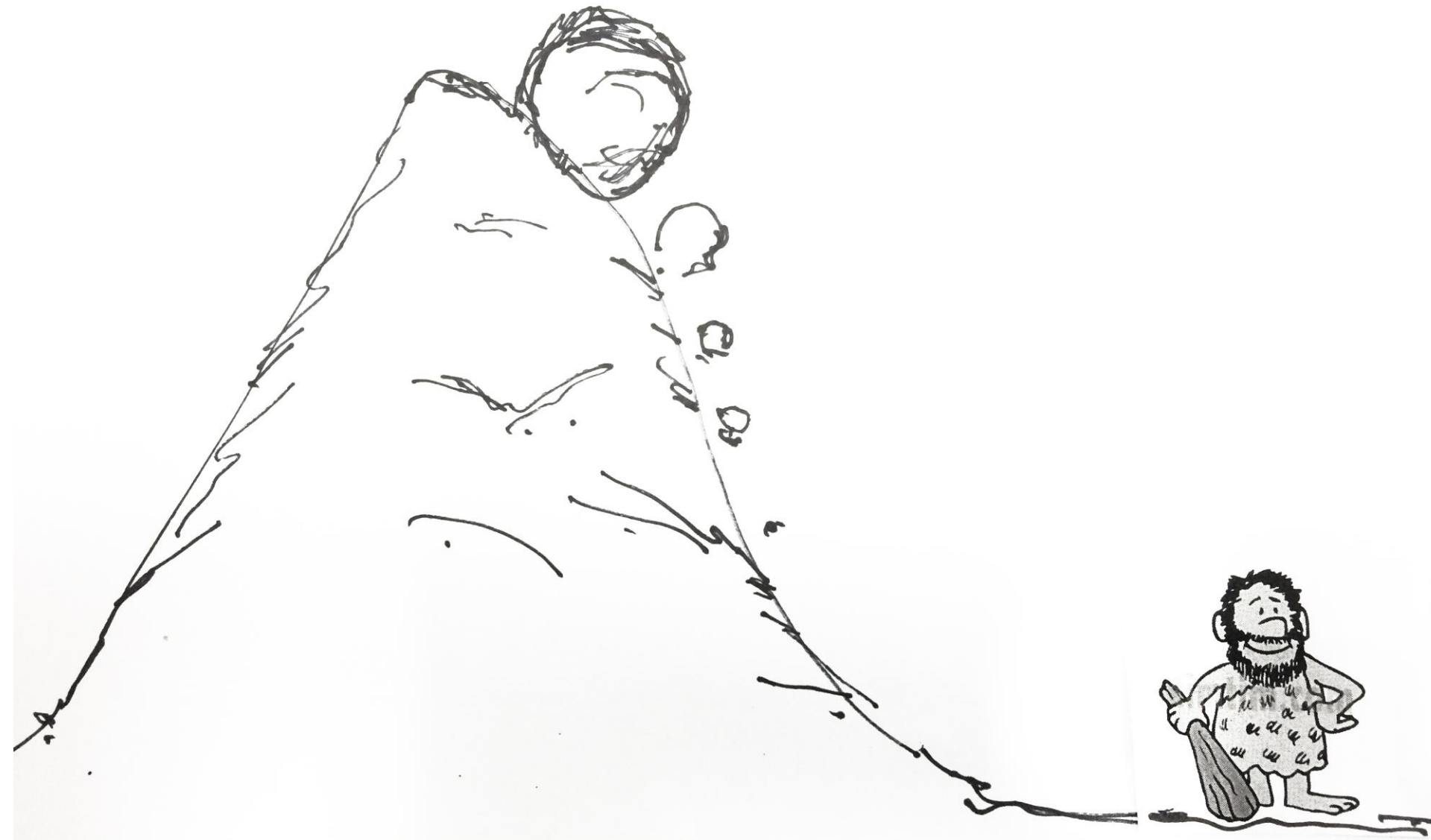


# Disaster Risk Management in India

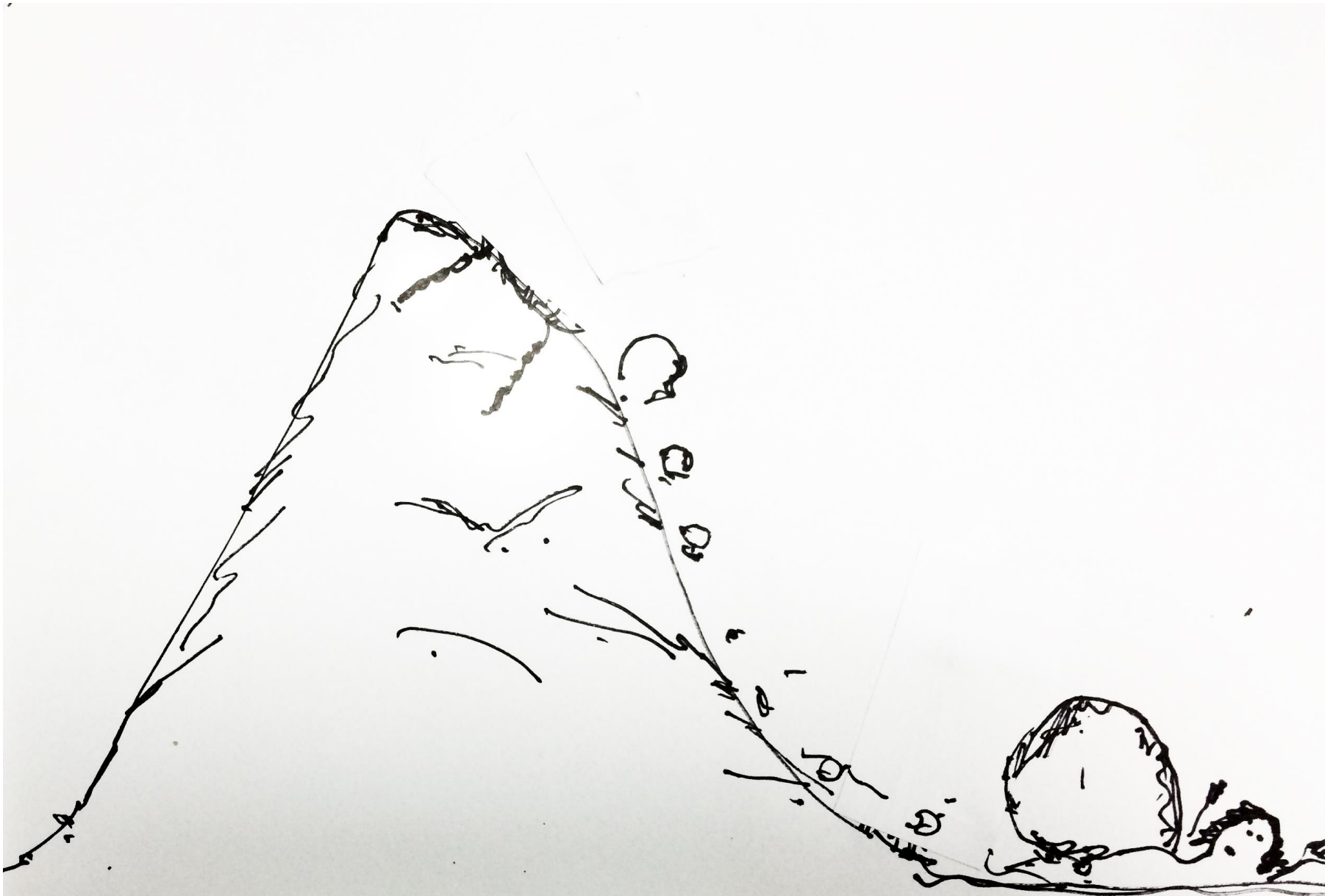
Kamal Kishore

New Delhi, 27 October 2016

# Hazard, Exposure and Vulnerability



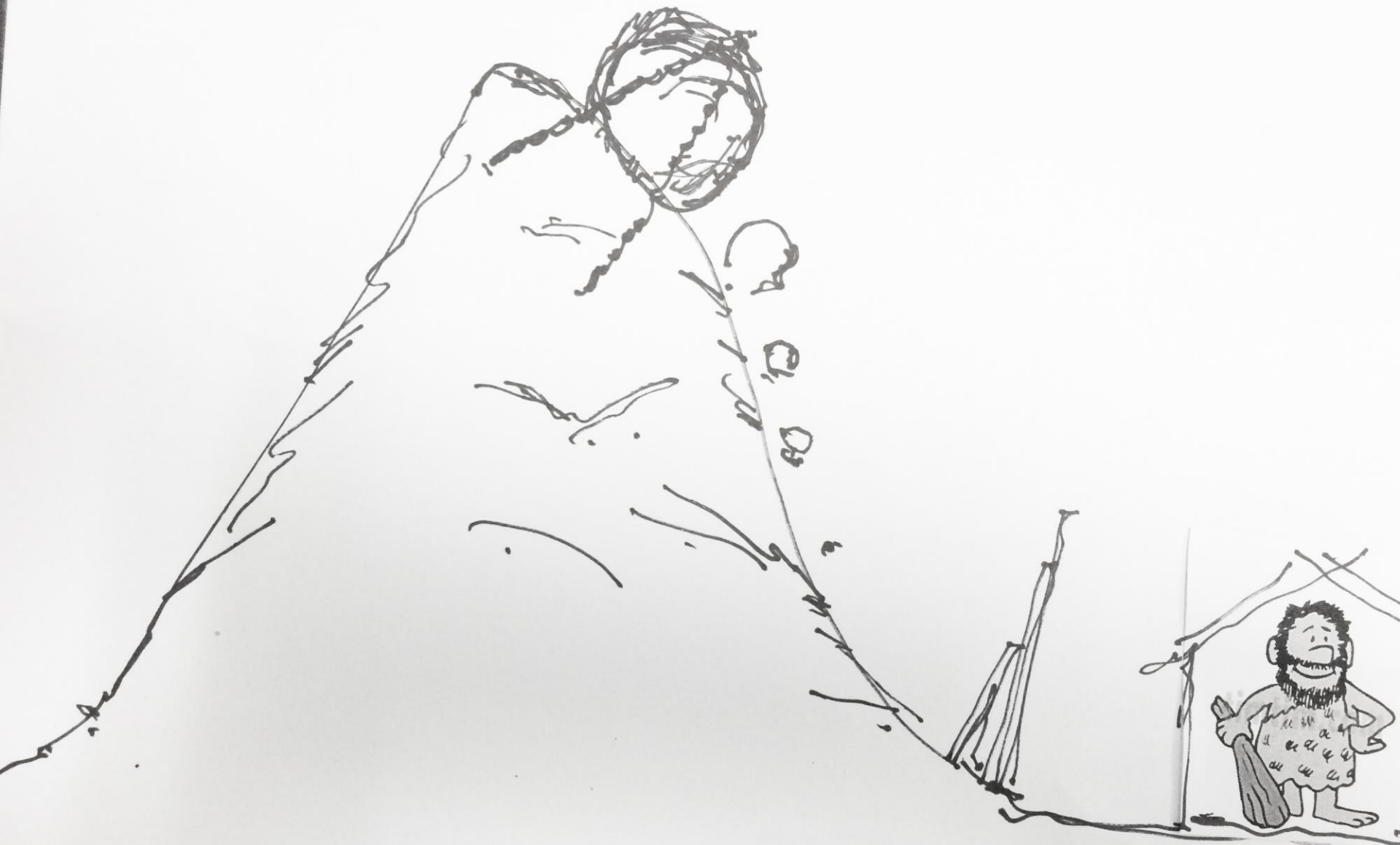
# Disaster



# Prevention



# Mitigation

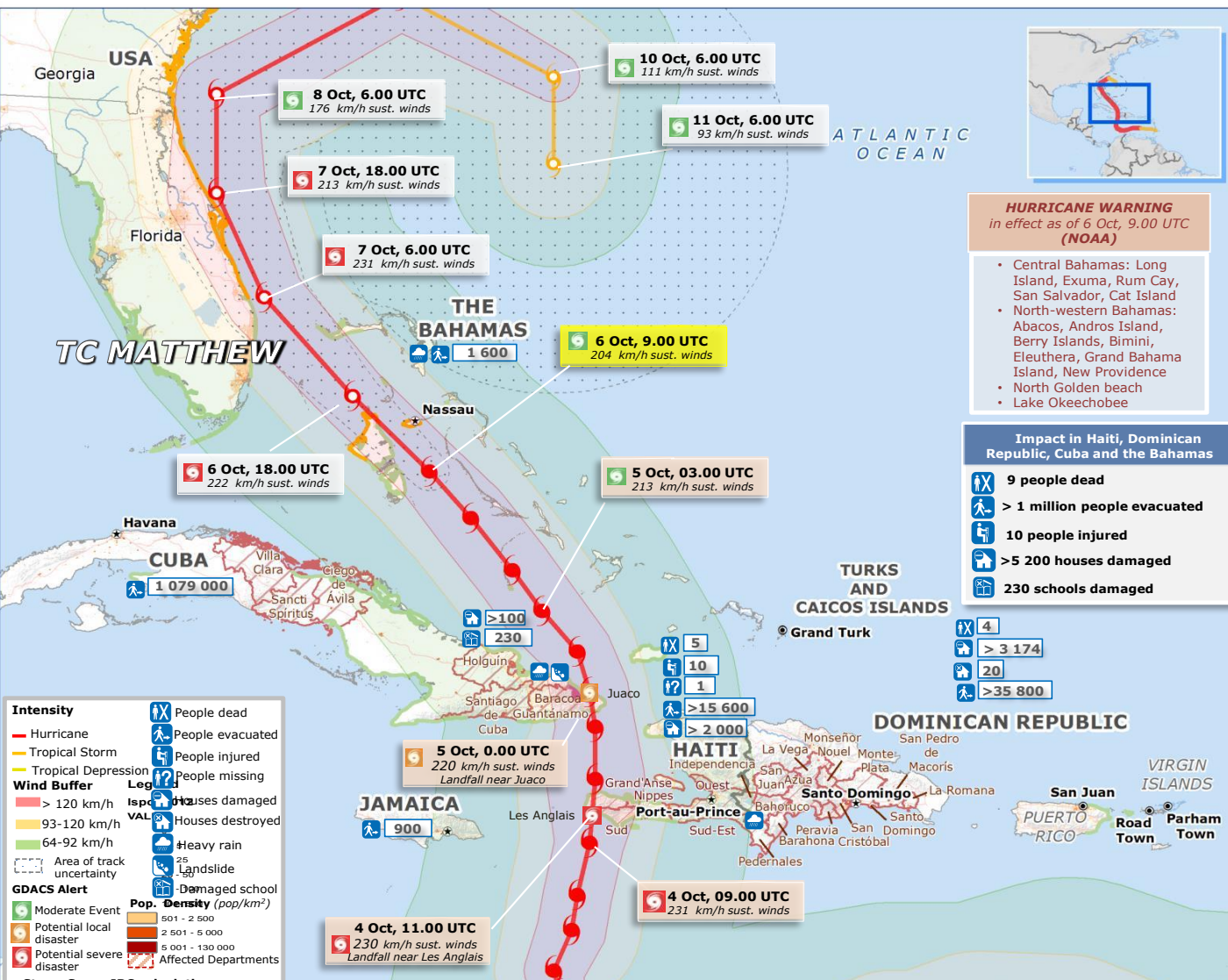


# Hurricane Matthew: Cuba & Haiti

Emergency Response Coordination Centre (ERCC) – ECHO Daily Map | 06/10/2016  
Haiti, Dominican Republic, Cuba, USA – Tropical Cyclone MATTHEW



European Commission | Humanitarian Aid and Civil Protection

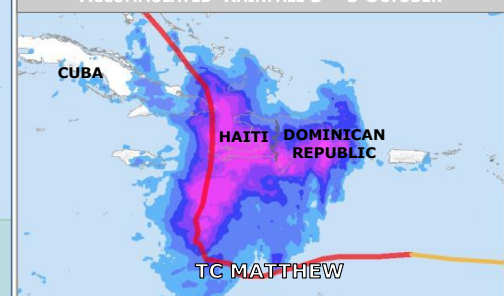


## SITUATION

- Tropical Cyclone MATTHEW continued moving north-west, passing through The Bahamas islands as a Category 3 Hurricane. On 6 October at 9.00 UTC, its centre was located 95 km south south-east of Nassau (The Bahamas) and 410 km south-east of west Palm Beach (Florida State, USA) and it had max. sustained winds speed of 205 km/h (Category 3 Hurricane).
- Over the next 24 h, it is forecast to continue moving north-west, strengthening. Its centre may pass near or over Andros Island and New Providence on 6 October afternoon and Gran Bahama island (The Bahamas) in the evening of the same date possibly as a Category 3 Hurricane. It then may pass near the eastern coast of the Florida peninsula on 7 October possibly as a Category 4 Hurricane. Heavy rain, strong winds and storm surge may affect the areas along its path. JRC calculations estimated a storm surge of 2.8 m in Red Bay (The Bahamas) on 6 October at 17.00 UTC.
- As of 6 October 9:00 UTC, Hurricane and Tropical Storm Warnings and Watches are in effect for several parts of the Bahamas, as well as several parts of Florida and South Carolina states (USA).
- Civil Protection Haiti is reporting 5 dead and over 2 000 houses damaged. OCHA reports 10 people injured and over 15 600 evacuated in the Departments of Grand'Anse, Nippes, West, Centre, South and Southeast (Haiti). However, due to lack of access to many affected areas a full picture of the situation is not yet available. Authorities in the Dominican Republic report 35 019 displaced in family houses and 794 in official shelters with 3 174 houses partially damaged and 20 destroyed. Hundreds of houses have also been damaged in Baracoa (Guantanamo province, Cuba). According to official reports, more than 1 million are estimated to be evacuated throughout the region.

Sources: ECHO, GDACS, NOAA, Meteo-Haiti, OCHA, UN, Cuba Gov., COGIC, Local Media

## ACCUMULATED RAINFALL 3 – 5 OCTOBER





# Differential Impacts

## **Cuba**

Deaths: 0

Evacuated: 70,000

Population of most affected municipalities: 300,000

## **Haiti**

Deaths: 548 (+128 missing)

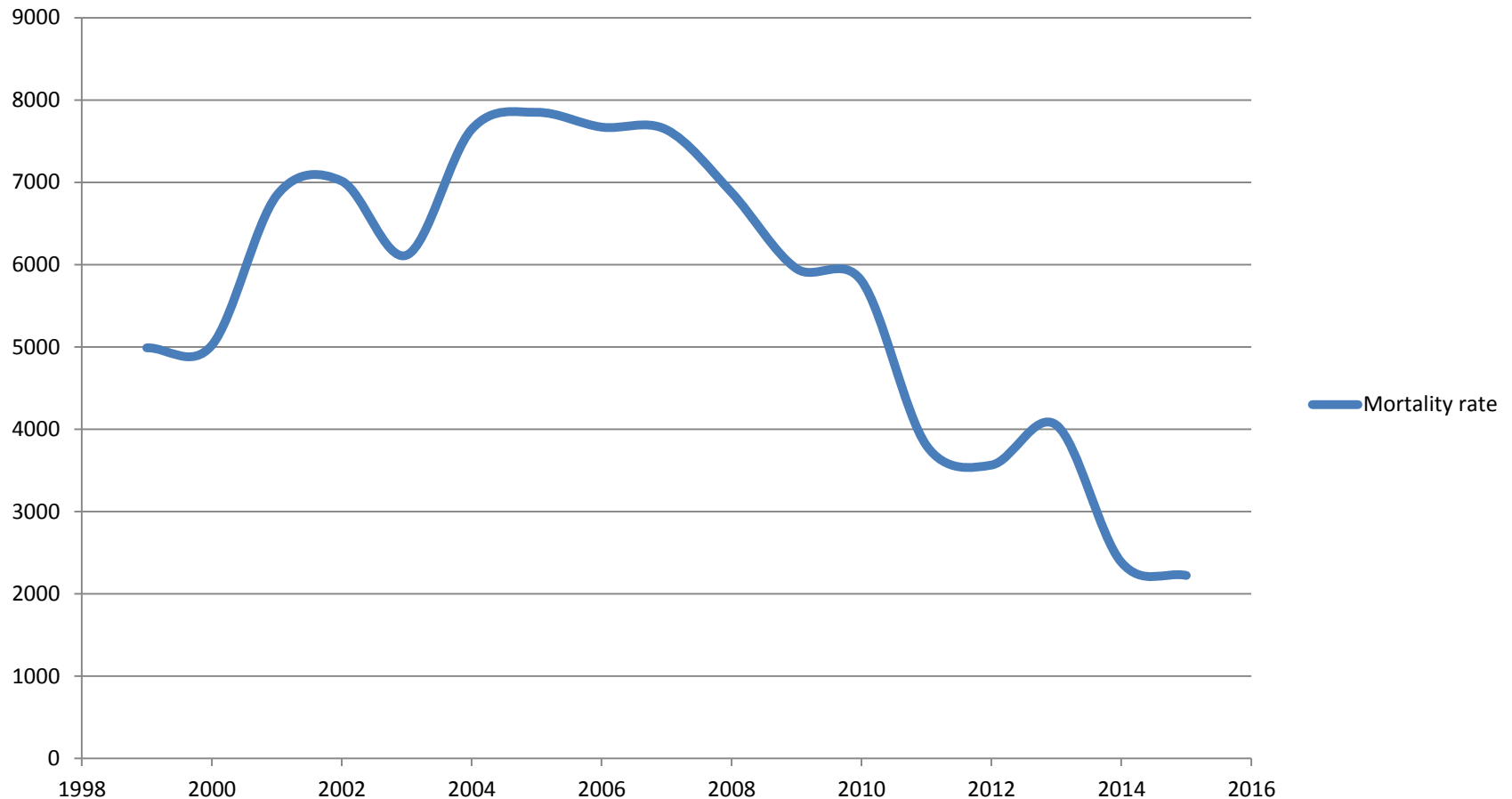
Evacuated (displaced): 175,000

Population of most affected municipalities: 1,000,000

# Indian Scenario

## Declining Disaster Mortality: false comfort?

Disaster Mortality (10-year moving average)





# Indian Scenario

Probabilistic assessment by the Global Assessment Report (UNISDR) estimates expected direct average annual losses for India at **\$10 billion per year**

India along with China is placed as top four countries (others include Japan, USA) as "high risk" in absolute economic exposure due to natural hazards (Natural Hazards Risk Atlas 2014 by British Risk Assessors Maplecroft)

# What leads to high level disaster risk?

**HAZARDS:** almost all principal natural hazards: earthquakes, floods, cyclones, drought, and landslides

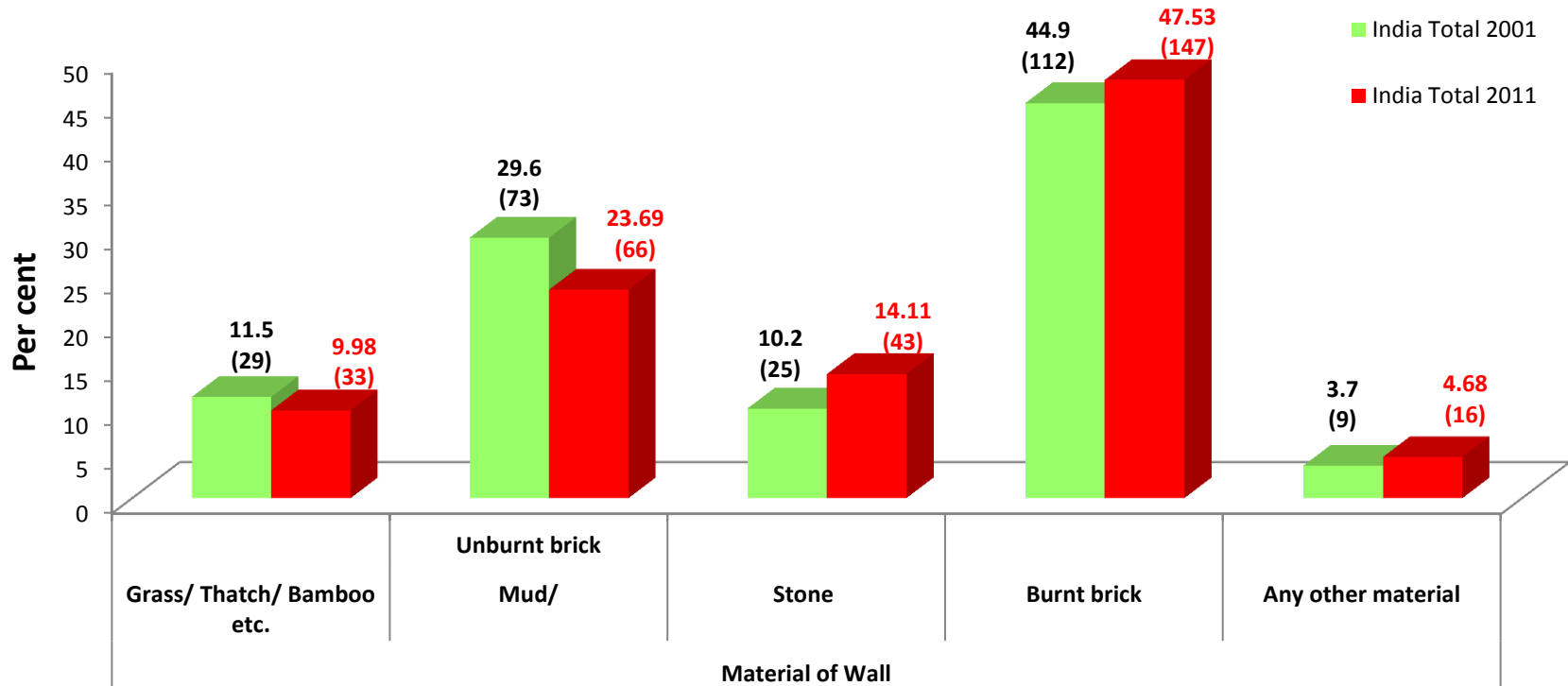
**EXPOSURE:** Large, disproportionate concentration of people, capital assets and economic activity in hazard prone areas. This exposure is increasing!

**VULNERABILITY:** Inherent vulnerability of the built environment, socio-economic systems, environmental concerns exacerbating risk

# Disproportionate Exposure

| Seismic Zone    | Area           | Total Population (2001) |
|-----------------|----------------|-------------------------|
| <b>Zone V</b>   | <b>10.90 %</b> | <b>9%</b>               |
| <b>Zone IV</b>  | <b>17.30 %</b> | <b>27%</b>              |
| <b>Zone III</b> | <b>30.40 %</b> | <b>42%</b>              |

# Increasing Vulnerability



Note: Figures in bracket are the number of houses in Million.

- Share of houses, which are prone to Earthquakes, is growing while the share of traditional houses which can withstand disasters is reducing.

# Disaster Risk Management in India

From a response centric approach to a holistic approach.

Disaster Management Act, 2005 provides for:

- Establishment of legal and institutional framework at all three levels i.e. National, State and District
- The federal structure of Indian governance provides both opportunities and challenges for disaster risk management
- Formulation of policy and plan backed by statutory and financial support at all levels.
- Mainstreaming of multi-sectoral DM concerns into the developmental process and mitigation measures.

# Mainstreaming Disaster Risk Management

- All Ministries required to prepare their Plan and provides funds for mitigation, preparedness and capacity building
- Flexi Funds available with Central Ministries
- Normal Funds from other sources can also be used
- Specific Funds created at National and State level for Response
- Post disaster reconstruction be undertaken with Plan Funds

Thank You