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Cambridge Centre for Risk Studies 2018 Risk Summit

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# CLIMATE CHANGE, PROTECTION GAP, AND THE EMERGING MARKETS

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Centre for Risk Studies

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# Climate change: role of insurance



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### Climate protection gap widening, warns insurance report

By Mark Kinver  
Environment reporter,



7 December 2016

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### Insurers should consider climate risk more - industry group

Reuters Staff

LONDON, Dec 7 (Reuters) - Insurance industry leaders are warning that climate change strategies to plug an annual \$1 billion gap in coverage for catastrophes, a network of 29

## Climate change threatens ability of insurers to manage risk

Extreme weather is driving up uninsured losses and insurers must use investments to fund global warming resilience, says study

ENERGY

## Rising Impact Of Climate Change Causing \$100bn 'Protection Gap', Warn Insurance Leaders



Published 1 year ago on December 7, 2016

By Blue & Green Tomorrow



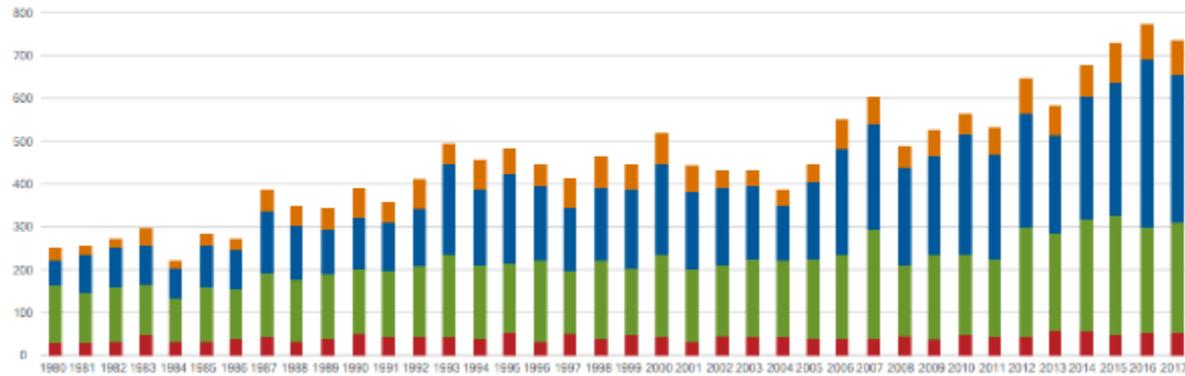
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# Climate change related disasters on the rise?

## Number of events

Relevant natural loss events worldwide 1980 - 2017

Number



## All Nat-Cats

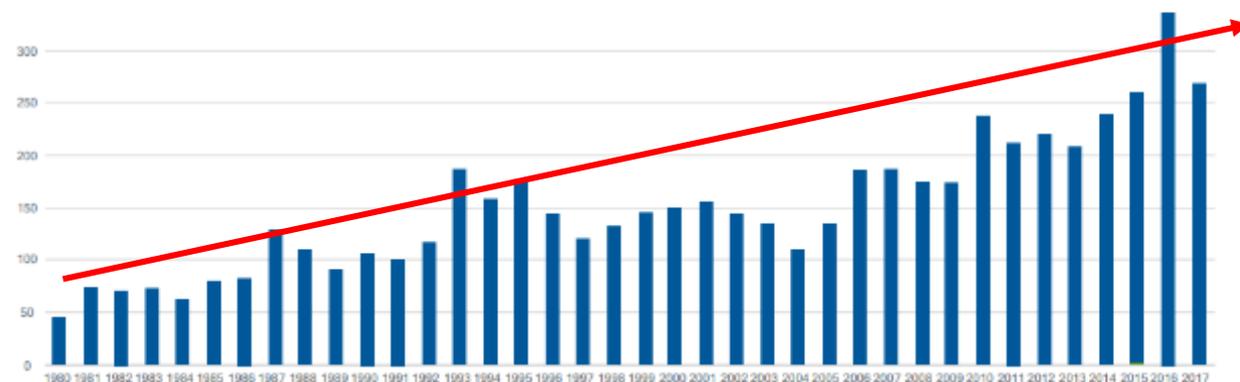
- Geophysical events (Earthquake, tsunami, volcanic activity)
- Meteorological events (Tropical cyclone, extratropical storm, convective storm, local storm)
- Hydrological events (Flood, mass movement)
- Climatological events (Extreme temperature, drought, forest fire)

Accounted events have caused at least one fatality and/or produced normalized losses ≥ US\$ income group of the affected country.

## Number of events

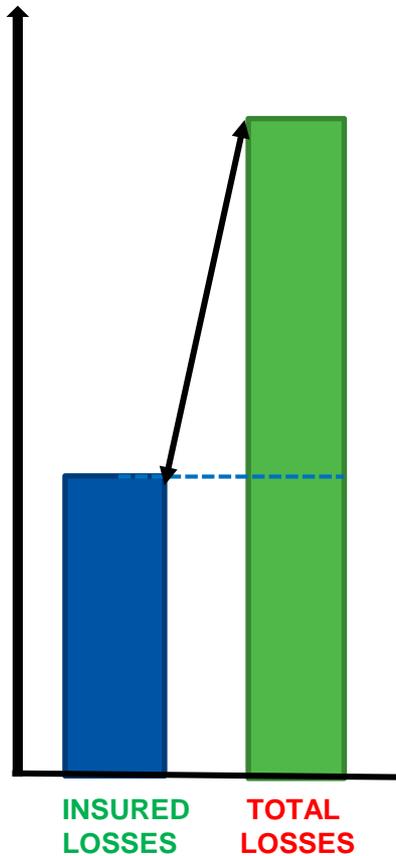
Relevant flood / flash flood events worldwide 1980 - 2017

Number



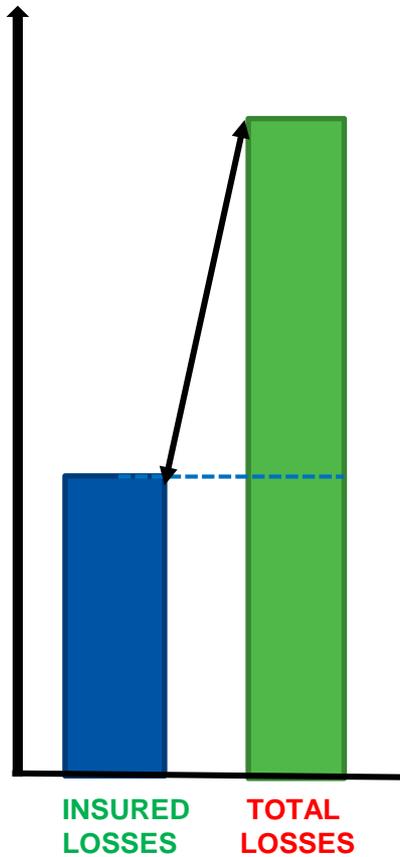
## Floods only

# What is the Protection Gap?



- It is defined as the difference between the amount of insurance coverage that is economically beneficial and what is actually being purchased
- It can be measured as the difference between the total losses and the insured losses due to a disaster

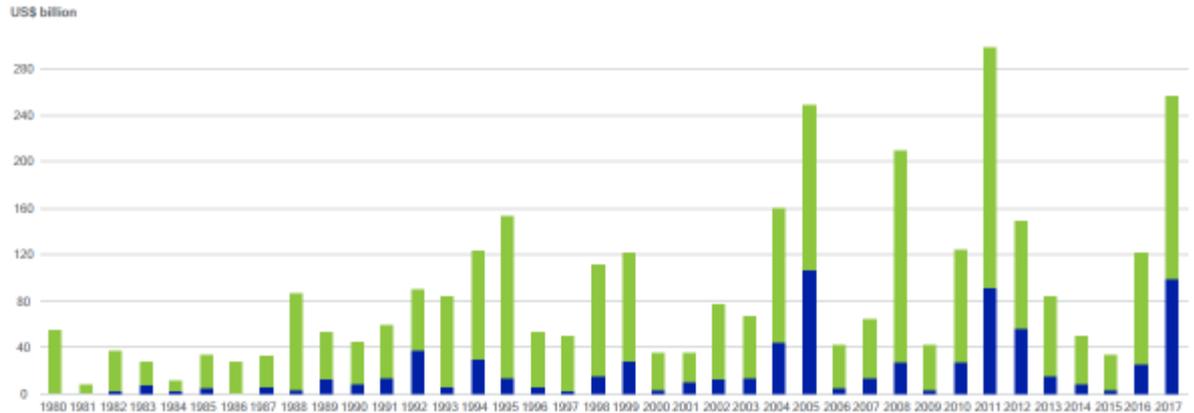
# What is the Protection Gap?



Overall and insured losses in US\$

Catastrophic natural loss events worldwide 1980 - 2017

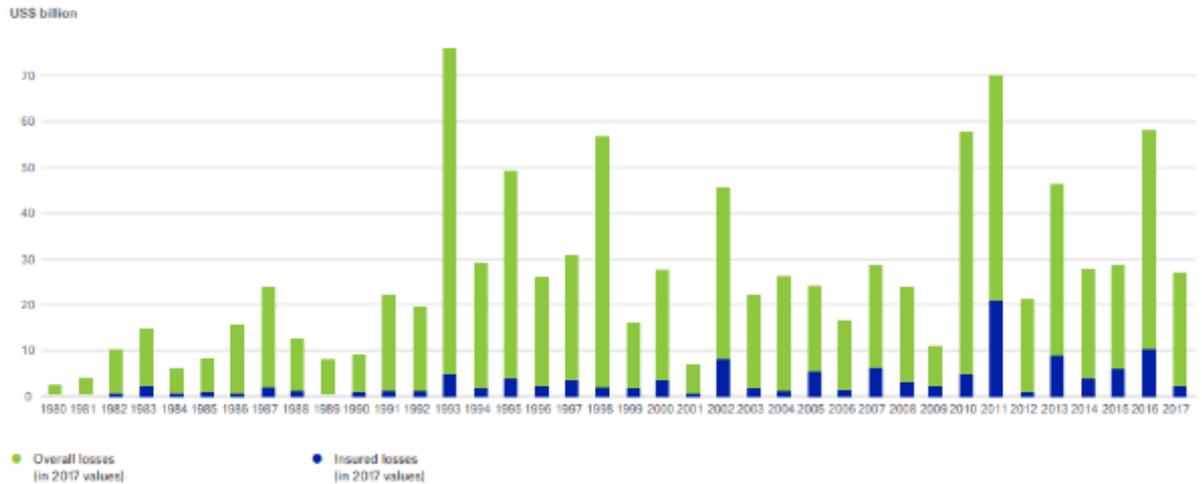
**All Nat-Cats**



Overall and insured losses in US\$

Relevant flood / flash flood events worldwide 1980 - 2017

**Floods only**



Inflation adjusted via country-specific consumer price index and consideration of exchange rate fluctuations between local currency and US\$.

# Why study both developed and emerging countries?

Income category	Avg. total losses per event (Million \$)	Avg. insured losses per event (Million \$)	Avg. uninsured losses per event (Million \$)	Average protection gap
High	460	184	<b>276</b>	60%
Upper middle	192	19	173	<b>90%</b>
Lower middle	148	5	144	<b>97%</b>
Low	122	2	119	<b>98%</b>

- **Protection gap:**
  - Significant gap exists across all income categories
  - Very large in low and middle income economies
- **Uninsured losses:**
  - High income countries face the largest uninsured losses
  - Increased risk due to exposure of high-value assets to natural disasters

# Research Objectives

## Project Scope:

The impact of (re-)insurance on the economic recovery from natural disasters

## Research questions:

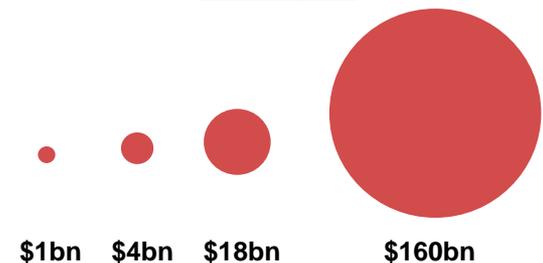
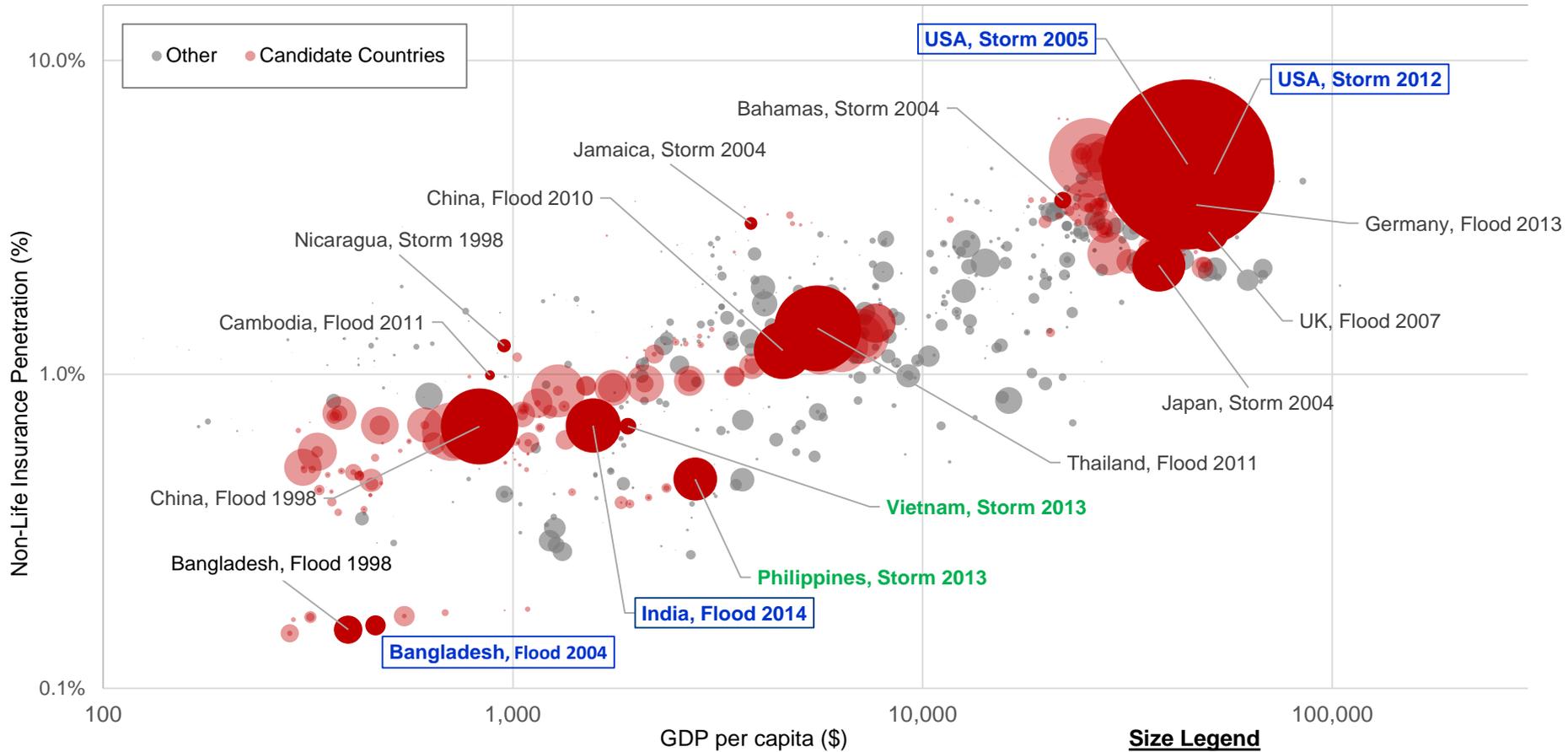
- What is the role of insurance in economic recovery and resilience?
- What are the similarities or differences in the recovery dynamics across countries?

## Methodology:

- Case studies
- Economic framework

# Insurance Penetration, GDP, and Economic Loss 1990-2015

Non-Life Insurance Penetration vs GDP per capita (log-log scale) – Flood & Storm Events 1990-2015 : Circle Size = Econ. Damage



# The case studies: flashcards

Bangladesh Floods 2004



India-Pakistan Floods 2014



US Hurricane Katrina 2005



US Superstorm Sandy 2012



# The case studies: flashcards

## Bangladesh Floods 2004

- Ranks very high for flood risks
- Event was unprecedented in terms of level of flooding in the country
- **Sectors affected:** agriculture, SME
- **Economic losses:** \$2.2 billion
- **Protection gap:** ~100%
- **Post-disaster funding:** Mostly government and external aid, followed by NGOs and limited private sector

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## US Hurricane Katrina 2005

- Gulf coast renowned for their hurricanes
- Most expensive natural disaster for the insurance industry
- **Sectors affected:** energy, housing
- **Economic losses:** \$108 billion
- **Protection gap:** 60%
- **Post-disaster funding:** NFIP, public grants, private insurance, external aid

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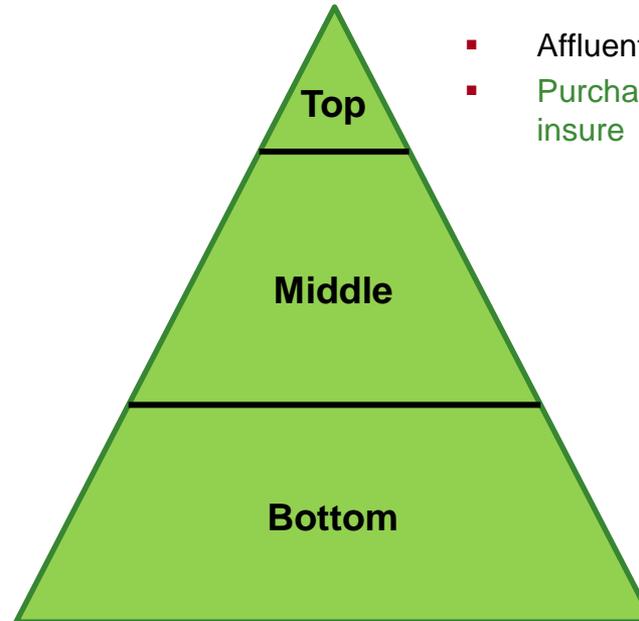
## US Superstorm Sandy 2012

- Affected densely populated and economically active areas
- Fourth costliest hurricane in US history
- **Sectors affected:** infrastructure, housing
- **Economic losses:** \$96 billion
- **Protection gap:** 50%
- **Post-disaster funding:** NFIP, public grants, private insurance, external aid

# What have we learnt from all these case studies?

Wealth distribution within each country significantly affects recovery dynamics

- Moderate to well educated
- Income depends on fixed assets that cannot be easily relocated
- Access to finance impacts a large part of their recovery process
- Potential insurance purchasers



- Affluent, high-income deciles
- Purchase private insurance or self-insure

- Low education levels
- Low disposable income or below poverty line
- Emotionally resilient to disasters and quickly adapt to new jobs due to low reliance of their income on fixed assets
- Low awareness of insurance mechanisms

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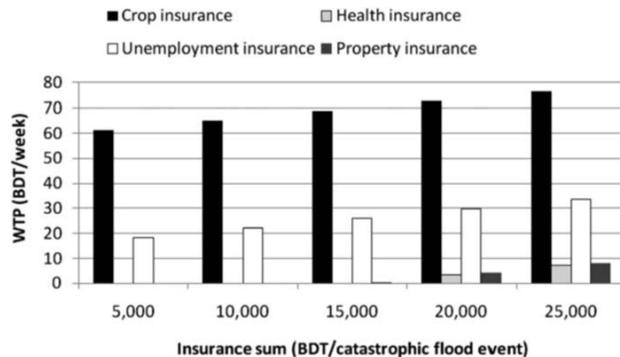
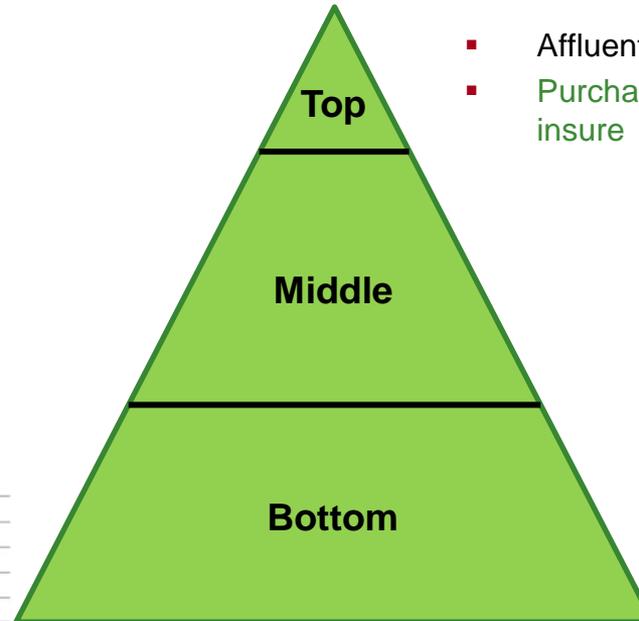


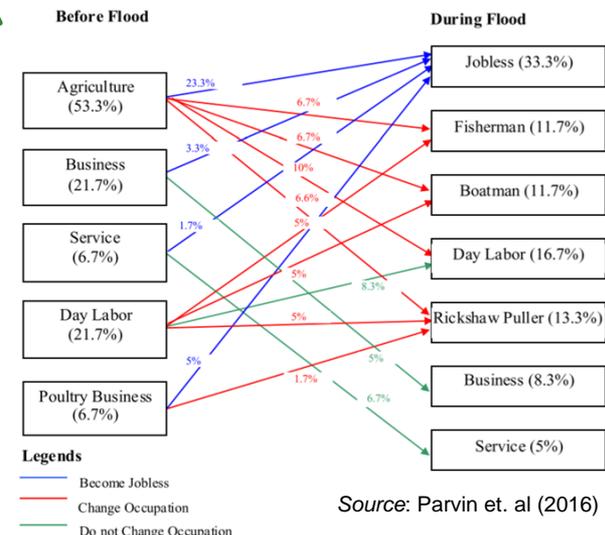
FIGURE 4 WTP for different insurance types and insurance cover

Source: Brouwer & Akter (2010)



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Source: Parvin et. al (2016)

# What have we learnt from emerging markets?

## Commonalities in lessons

- **Moral hazard:**
  - Reliance on ex-post disaster support over ex-ante protection such as insurance is prevalent
  - Government shoulders most costs of relief resulting in massive structural deficits and negative knock-on effects
- **Low trust in private insurance providers:**
  - Governments are seen as preferred insurance providers
  - Suppresses demand of private insurance (crowding out)
- **Previous exposure to disasters tends to improve insurance uptake:**
  - Those with prior exposure to floods and with better access to credit were more willing to purchase insurance
  - Eg., growth rate of insurance policies was 10% in India, but was 30% in Kashmir following the 2014 floods

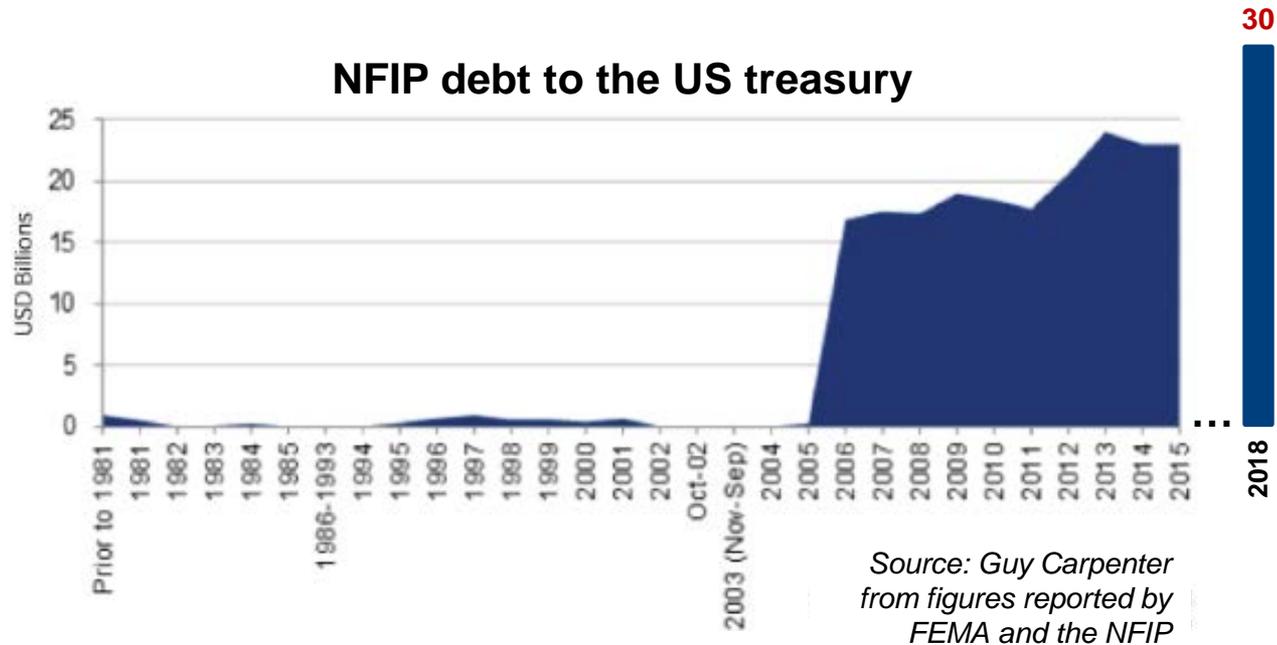
## Idiosyncratic differences

- **India:** Sharia-compliant insurance policies (Taqaful) are not an option because of secular nature of the banking system, unlike in Pakistan
- **Bangladesh:** In the absence of developed insurance markets, households in a few villages undertake self-insurance measures to mutualize losses

# Are there any lessons from the developed markets?

A lot of the lessons were on how-not to do

- **Excessive reliance on government** for “bailing” people out of disasters:
  - **Supplementation mindset:** Instead of supplementing private property insurance with federal disaster assistance, they relied entirely on the latter for post-disaster support (Herring, 2013)
  - **Lack of forward planning:** Resulted in unsustainable debt levels leading to massive structural deficit in the National Flood Insurance Program (NFIP)

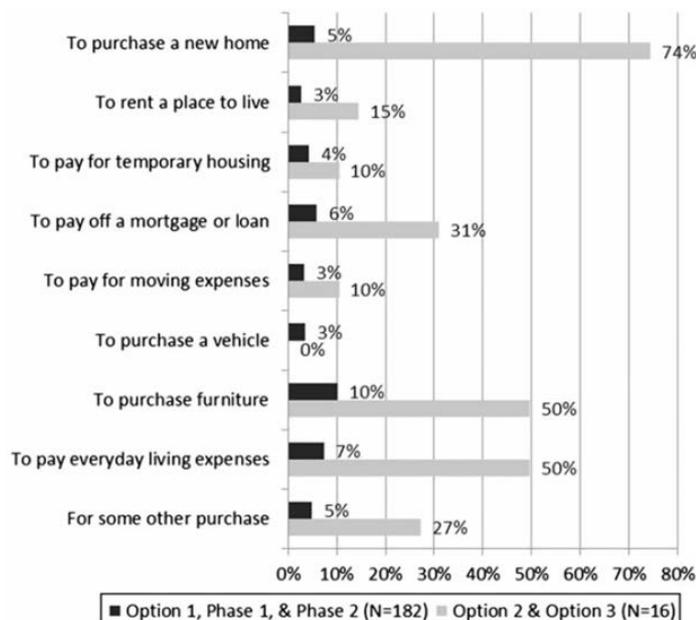


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## A lot of the lessons were on how-not to do

- **Excessive reliance on government** for “bailing” people out of disasters
- **Weak enforcement** of rules and policies:
  - **When mandatory is optional:** As a part of federal insured mortgage, flood coverage has been mandatory in the US. Only 40% of the victims in Louisiana and Mississippi had purchased insurance during Katrina (Kunreuther, 2006)
  - **Misuse of funds:** Many aid recipients used money for rebuilding for other purposes (Spader & Turnham, 2014)

Figure 1. Percentage of homeowner CDBG recipients who reported use of CDBG funds for nonrebuilding purposes.

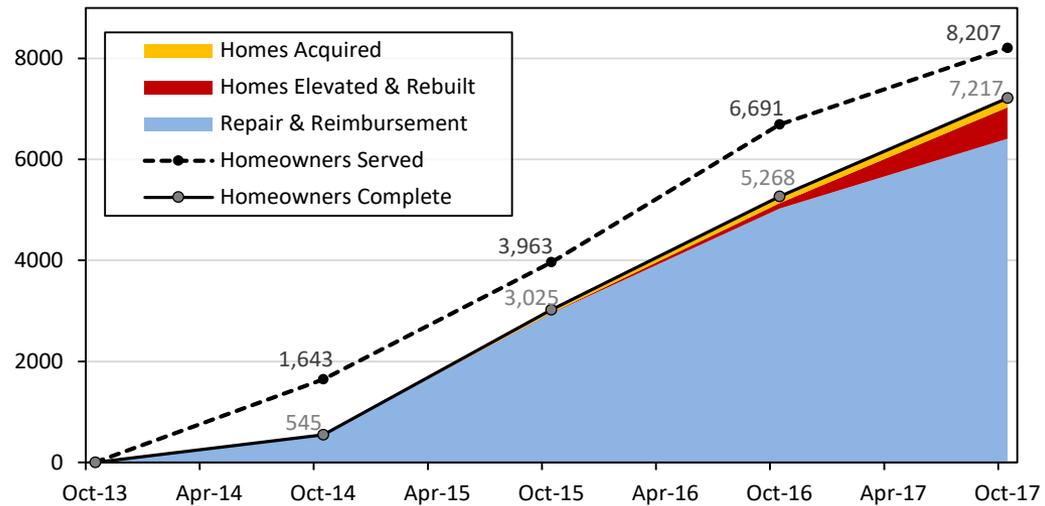


# Are there any lessons from the developed markets?

## A lot of the lessons were on how-not to do

- **Excessive reliance on government** for “bailing” people out of disasters
- **Weak enforcement** of rules and policies
- **Poor structure and implementation** of recovery process:
  - **Sluggish start:** In the first year nothing was built back after Sandy. Only two years later first reimbursement payments for rebuilding were made
  - **Lack of coverage:** Although, five years later, 99% of the Build It Back program participants received payments for construction, several homes did not profit from this assistance

**Build It Back Program Progress 2013-2017**



Source: Mayor's Office of Housing Recovery Operations (2017)

# Conclusions

- **Climate change** is a real phenomenon. Data tells us that natural disasters such as floods have become more frequent
- **Floods and storms** have resulted in severe damages to property and lives, and spiraled economic losses in key sectors placing a big burden on country finance
- **Ex-ante protection measures** such as insurance can improve recovery and resilience of cities after disasters through timely access to funds for reconstruction (Platt et al., 2014)
- **Large protection gap** exists in most countries and is particularly very high in emerging market economies due to low disposable income, lack of awareness, low trust in private insurers, moral hazard among other factors
- Studying across the whole spectrum of countries provides us with valuable insights for better design of insurance policies

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## Barriers to growth of private insurance:

- Weak regulatory capacity
- Crowding out by public sector
- Policy weakness such as lack of proper enforcement of policies
- Lack of stimulus for insurance purchase

## Opportunities in closing the gap:

- Public-private partnerships
- Policy reforms towards alignment of incentives to address moral hazard
- Communication of benefits from insurance

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