



# The Conceptual Framework of Disaster

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## Economic Losses

Fig  
Ni  
cc

Figure 7

Share of economic losses (%) by continent



Figure 8

Economic losses (billion US\$) by disaster type: 2018 compared to 2008-2017 annual average

167 **>** 132  
2008 to 2017 in 2018

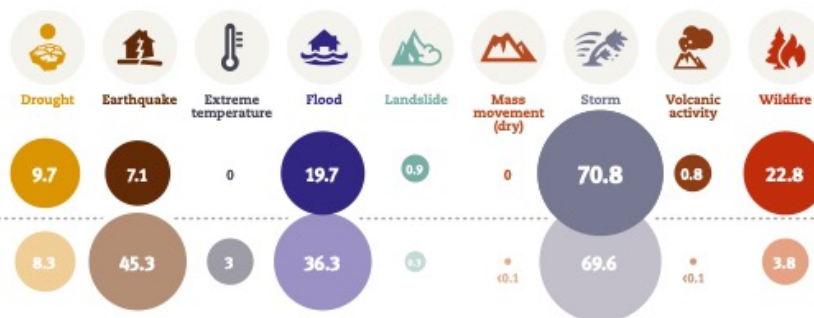
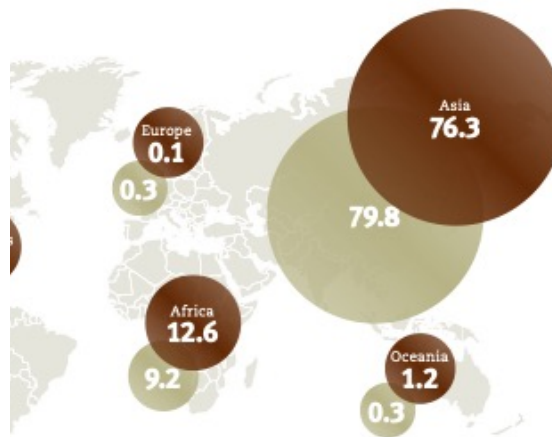


Table 3

Top 5 economic losses

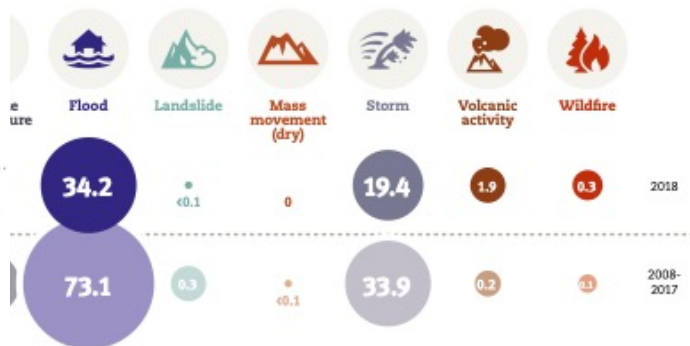
USA	Wildfire	16.5 billion
USA	Hurricane Michael	16 billion
USA	Hurricane Florence	14 billion
Japan	Typhoon Jebi	12.5 billion
Japan	Flood	9.5 billion

## Impact: total affected<sup>5</sup>



(million) by disaster type: -2017 annual average

198.8 **>** 68.5  
2008 to 2017 in 2018



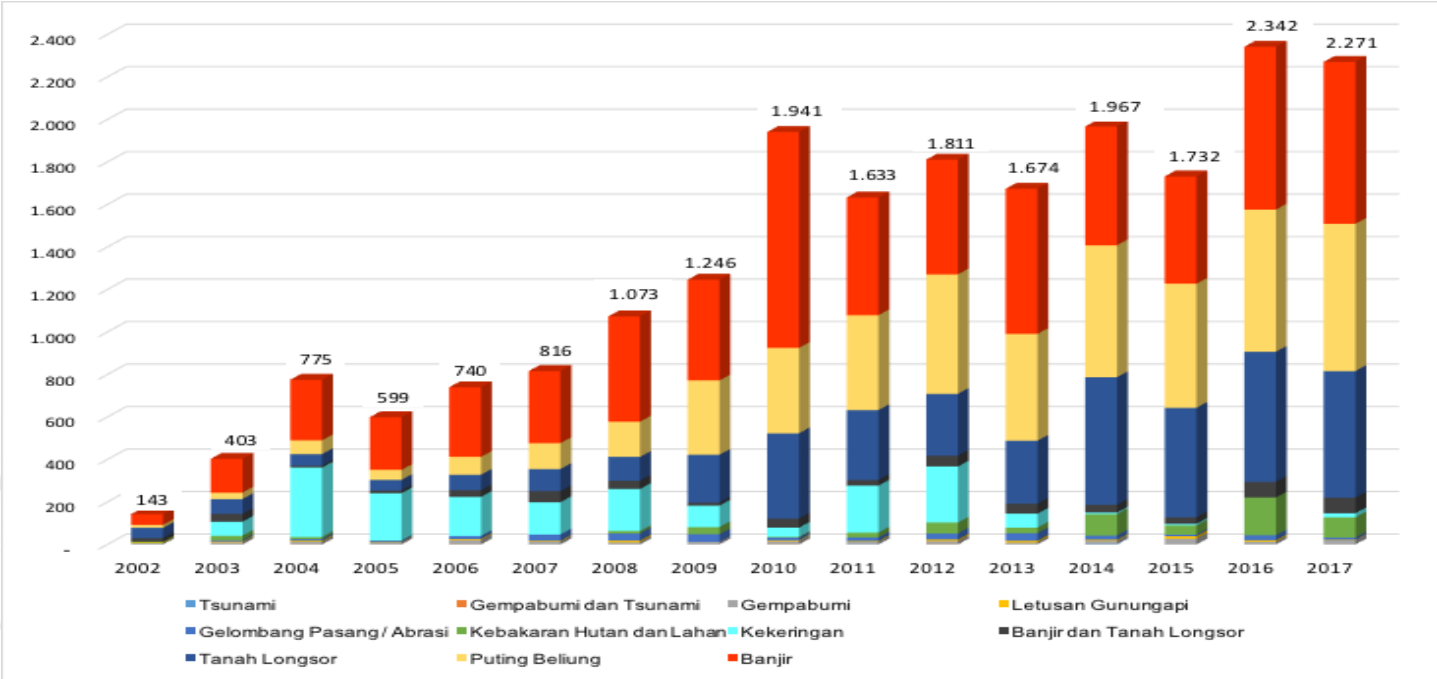
India	Flood	23.2 million
Philippines	Typhoon Mangkut (Ompong)	3.8 million
Afghanistan	Drought	3.6 million
Kenya	Drought	3.0 million
China	Storm	2.5 million

The need for global  
disaster risk reduction is  
greater than ever...





## Trend of disasters in Indonesia 2002-2017







# Disasters occurred during 2017



BNPB

## BENCANA TAHUN 2017

1 JANUARI 2017 - 19 DESEMBER 2017

Data bencana tahun 2017 dengan jumlah 2.271 kejadian bencana (18/12/2017). Bencana hidrometeorologi mendominasi kejadian bencana tahun 2016, banjir menempati urutan pertama diikuti puting beliung & tanah longsor. Bencana tahun ini menyebabkan lebih dari 3,4 juta jiwa lebih mengungsi dan merenggut 372 jiwa serta merusak lebih dari 39 ribu unit rumah.

**TOTAL BENCANA TAHUN 2017**  
1 Januari 2017 -19 Desember 2017

# 2.271

**GEMPABUMI 6,5 SR**  
ACEH TENGGARA,  
11 April 2017

2 Jiwa Meninggal Dunia  
298 Rumah Rusak

**ERUPSI GUNUNGAPE**  
SINABUNG, SUMATERA UTARA  
20 Mei 2017

348 Hewan Sementara  
2.038 Jiwa Mengungsi

**BANJIR**  
MURUNG BAYA, KALIMANTAN TENGAH  
17 Agustus 2016

21.608 Jiwa Terdampak  
6.631 Rumah Terendam

**BANJIR**  
KAB. GORONTALO, GORONTALO  
2 Juni 2017

3.877 Jiwa Terdampak  
484 Rumah Terendam

**GEMPABUMI**  
KAB. POSO, SULAWESI TENGAH  
29 Mei 2017

348 Rumah Rusak  
25 Luka-luka

**BANJIR**  
LUWU TIMUR, SULAWESI SELATAN  
12 Mei 2017

7 Jiwa Meninggal Dunia  
14 Rumah Rusak

**BANJIR**  
PADANG SIDEMPUAN, SUMATERA UTARA  
26 Maret 2017

5 Jiwa Meninggal Dunia  
2.000 Jiwa Terdampak

**LONGSOR**  
LIMAPULUH KOTA, SUMATERA BARAT  
2 Maret 2017

8 Jiwa Meninggal Dunia  
3.012 Jiwa Terdampak

**GEMPABUMI**  
TASIKMALAYA, JAWA BARAT  
16 Desember 2017

4 Jiwa Meninggal Dunia  
2.473 Rumah Rusak

**BANJIR**  
MAGELANG, JAWA TENGAH  
29 April 2017

13 Jiwa Meninggal Dunia  
378 Jiwa Mengungsi

**LONGSOR**  
PONOROGO, JAWA TIMUR  
1 April 2017

28 Jiwa Meninggal Hilang  
178 Jiwa Mengungsi

**LONGSOR**  
NGANJUK, JAWA TIMUR  
9 April 2017

5 Jiwa Tertimbun Longsor  
2 Desa Terdampak

**LONGSOR**  
KINTAMANI, BALI  
9 Februari 2017

13 Jiwa Meninggal Dunia & Hilang  
8 Luka-luka

**ERUPSI GUNUNGAPE**  
KARANGASEM, BALI  
25 September 2017

0 Jiwa Meninggal Dunia & Hilang  
151 Ribu Jiwa Mengungsi

**BANJIR & TANAH LONGSOR**  
SIDENRENGRAPPANG, SULAWESI SELATAN  
7 Agustus 2017

497 Jiwa Terdampak  
100 Rumah Terendam

**KERUSAKAN AKIBAT BENCANA TAHUN 2016**

# 44.539

**RUMAH RUSAK**

# 1.243

**FASILITAS PENDIDIKAN RUSAK**

# 113

**FASILITAS KESEHATAN RUSAK**

# 643

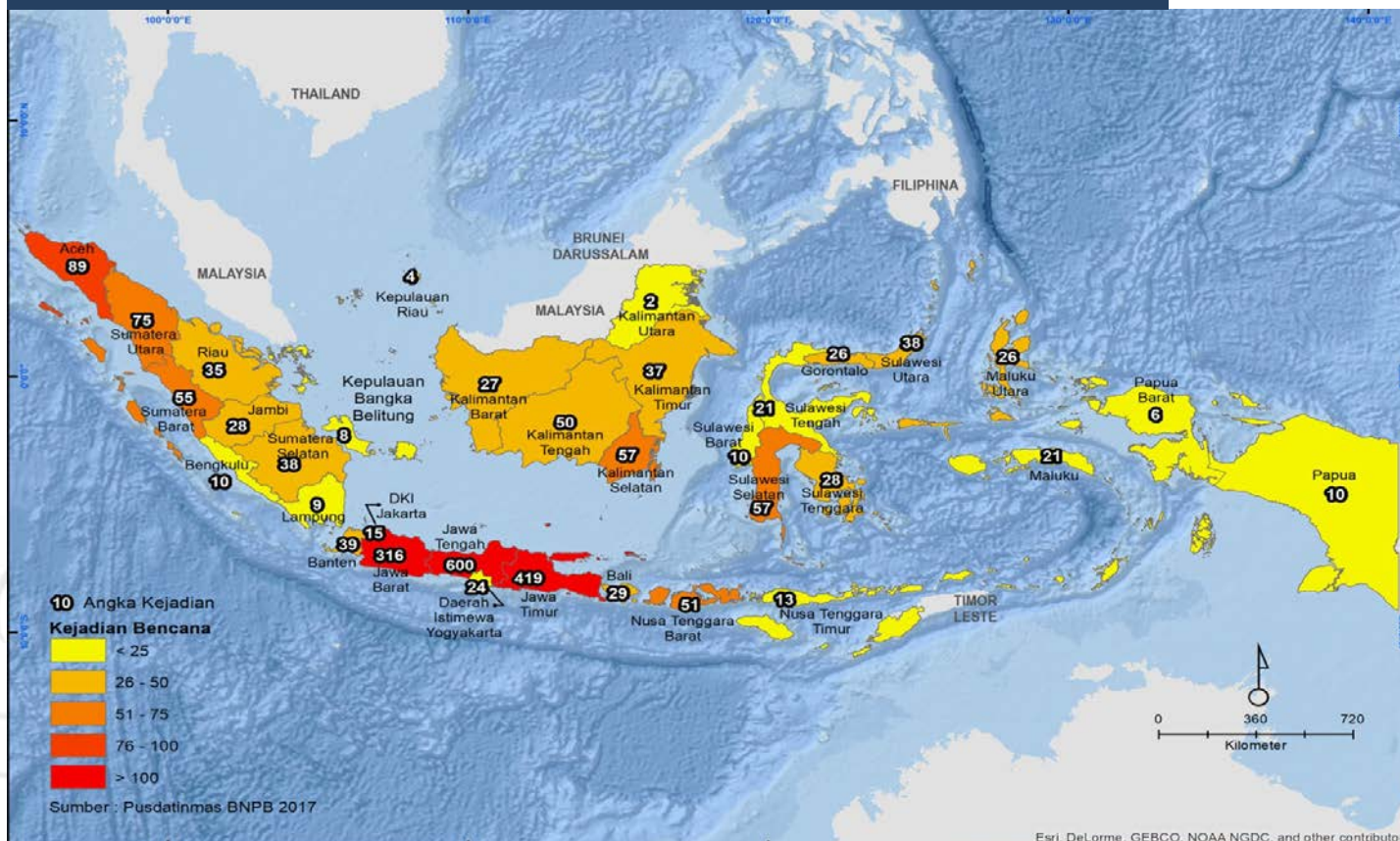
**FASILITAS PERIBADATAN RUSAK**

**DAMPAK BENCANA TAHUN 2017: 372 JIWA MENINGGAL DUNIA & HILANG 3,446 Juta JIWA TERDAMPK & MENGUNGI**

1 Januari 2017 - 19 Desember 2017

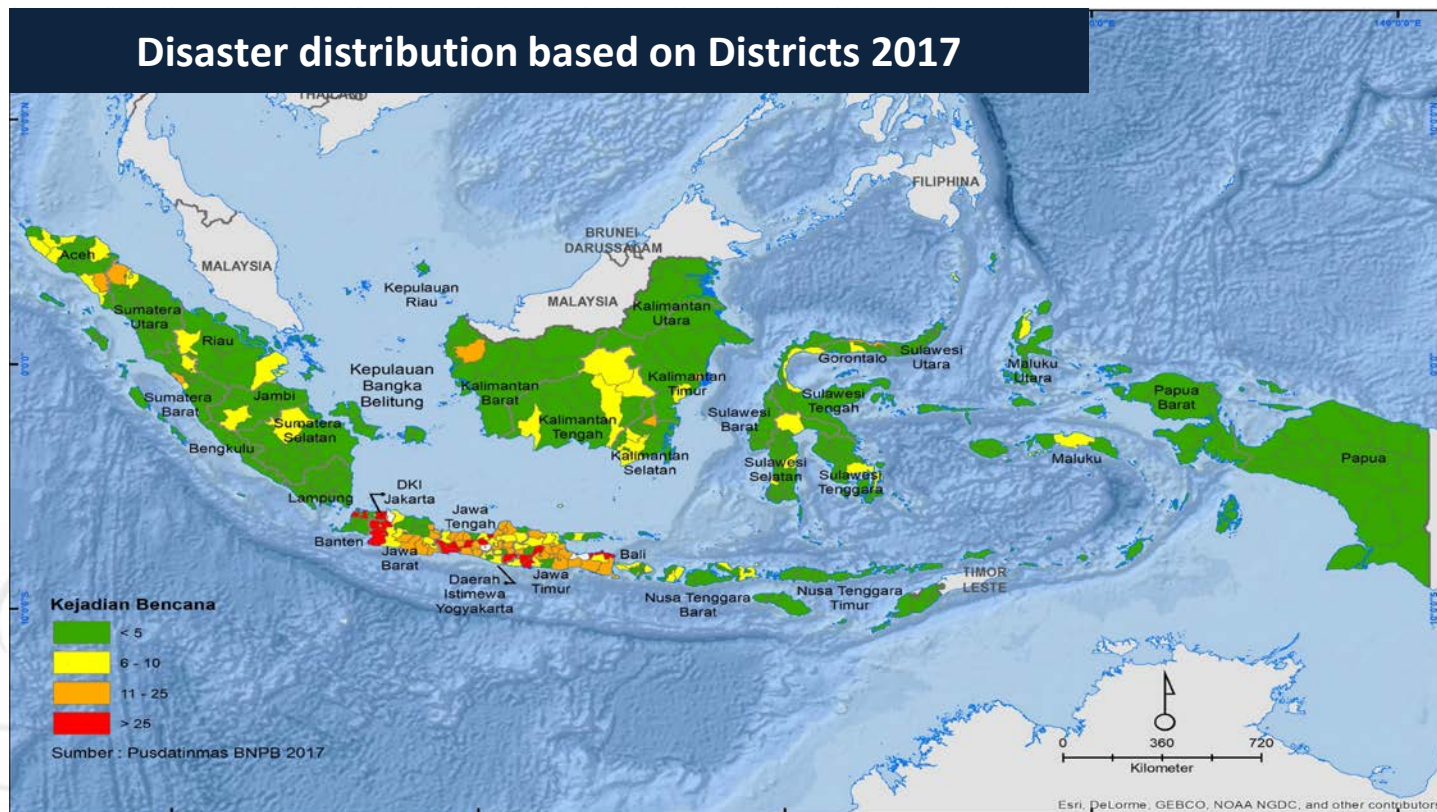


# Disaster distribution based on province in 2017





## Disaster distribution based on Districts 2017





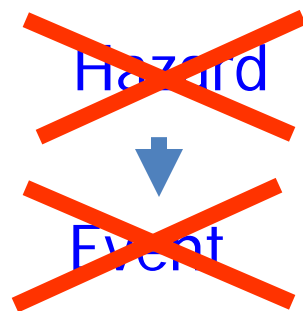


“a serious **disruption of the functioning** of a **community or a society** involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources”\*

*\*WHO, Risk reduction and emergency preparedness: WHO six-years strategy for the health sector and community capacity development. 2007*













# Hazard

a dangerous phenomenon, substance, human activity, or condition that may cause loss of life, injury, or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, and/or environmental damage

- Natural or human-made phenomenon or mixture of both
- Has the *potential* to adversely affect human health, property, activity, and/or the environment
- Potential energy”



# Hazards

## ■ Natural

- Geophysical
- Climatological
- Meteorological
- Hydrological
- Biological

## ■ Human-made (anthropogenic)

- Technologic
  - Stored chemicals
  - Unstable structures
  - Unexploded bomb
  - Transport
- Potential Conflict

## ■ Mixed (natural + human)

- Health-related







# Event

- Something that happens or takes place
- An occurrence that has the potential to affect living beings/and or their environment; the actualization of a hazard
- The actualization of the hazard
  - Primary (precipitating) event: event responsible for initiating the damage (eg. Hurricane Katrina)
  - Secondary events: events that result from the primary event (eg. flood of New Orleans as a result of Hurricane Katrina)
- Release of energy



# Events

## Natural

### ■ Geophysical

- Earthquake
- Volcano eruption

### ■ Climatological

- Wind
- Precipitation
- Wildfires
- Temperature extremes
- Drought
- Desertification

### ■ Hydrological

- Floods
- Avalanche
- Tsunami

### ■ Meteorological

- Storms

### ■ Biological

- Epidemic
- Insect infestation



# Events

## Human-made (anthropogenic)

### ■ Technological

- Substance release
- Transport accident
- Structural collapse/failure
- Explosions
- Fire
- Environmental interference

### ■ Conflict

- Armed (war, terrorism, complex)
- Unarmed (sanctions, embargo)

## Mixed

- Landslide
- Epidemic





Hazard

Event



# Characteristics of Events

- Onset
- Duration
- Amplitude
- Intensity
- Scope
- Magnitude
- Scale

**DURATION**

**ONSET**

**Sudden**  
(secs-hrs)

**Gradual**  
(days-weeks)

**Slow**  
(mnths-yrs)

**Brief** (secs-hrs)

Earthquake  
Tsunami  
Volcanic eruption

**Short** (hrs-days)

High Winds  
Flash floods

Floods  
Temp extremes

**Intermediate**  
(days-weeks)

Volcanic eruption  
Armed conflict  
Epidemics

Epidemics

Epidemics

**Prolonged**  
(months-years)

Armed conflict

Armed conflict

Drought  
Famine <sup>12</sup>  
Conflict



# Event Characteristics

- Amplitude: the degree of departure from the point of equilibrium
  - Storm crest, storm surge height, Richter scale
- Intensity: the amount or force of energy per unit of time
  - the integral of amplitude over a given period of time (amplitude/time interval).
  - Rainfall/hour



# Event Characteristics

- Scope: the extent of the area of subject matter that something deals with or to which it is relevant
  - the area covered by a given activity
  - in terms of a disaster, scope refers to the area effected by an event
- Magnitude: the total amount of energy released; a mathematical quantity
- Scale: the scope and magnitude of an event intensity in an area (intensity x area)
  - Incidence of disease in county, hectares flooded







# Structural Damage

- The physical disruption of structure(s) that results from the energy released during an event:
  - Humans and other living things
  - Human-built structures
  - Environment
  
- Harm or injury impairing the value or usefulness of something, or persons



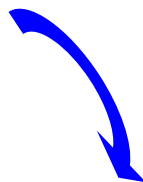
Event



Structural  
Damage



Event



Structural  
Damage





# Functional Damage

## (Loss of Function)

- Damage that results in a change in/loss of function of living creatures, or the systems essential to societal function(s)
  - Damaged bridge leads to loss of means of transportation
  - Collapsed hospital leads to loss of healthcare services
  - Contaminated wells lead to loss of potable water

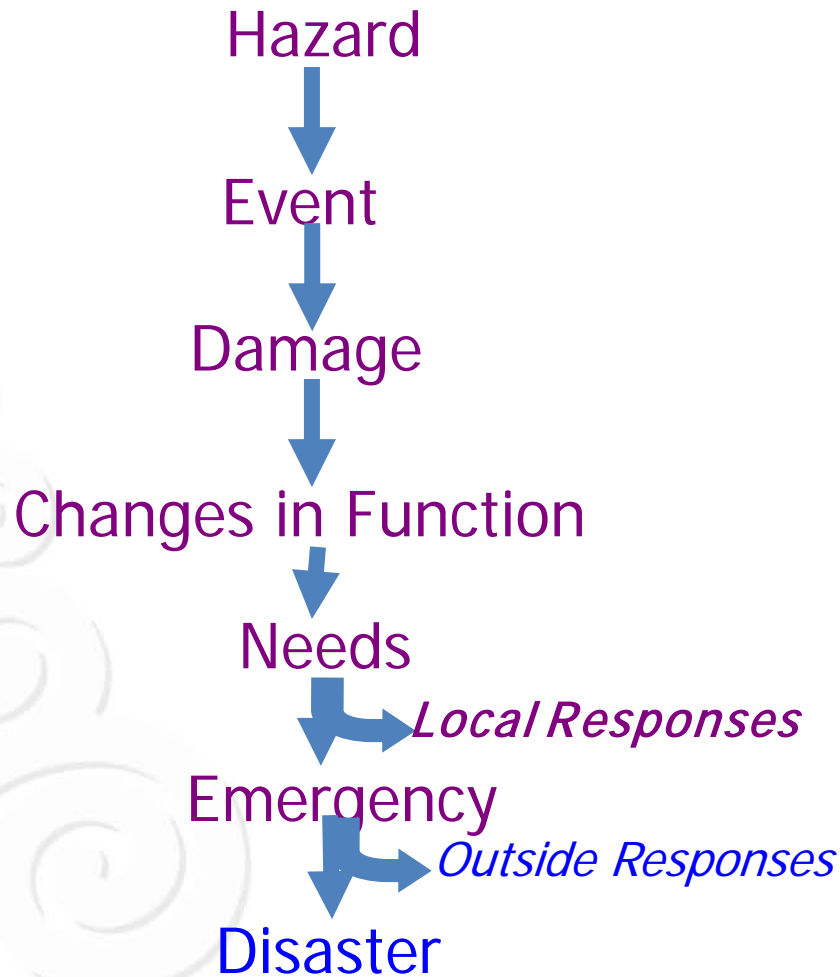






# NEEDS

The differences between the requirements and available resources that occur as a result of functional damage





# Emergency

- An occurrence or set of circumstances demanding immediate action
- An emergency occurs when an individual or society must use its (local) response capacity to meet the need(s) created by the changes in or loss of function(s)



# Local Response













# Disaster

- A disruption of a society, or component of a society, of such magnitude **that the needs exceed its ability to cope** without outside help; a situation that **overwhelms local response** capacity



# The Conceptual Framework Defines the Language of Disasters

## ■ Distinguishes between

- Hazard
- Event
- Structural Damage
- Functional Damage
- Emergency
- Disaster

The Event IS NOT the Disaster!!!!!!



## What is depicted below?

- A. Hazard
- B. Event
- C. Structural Damage
- D. Functional Damage
- E. Disaster





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- A. Hazard
- B. Event
- C. Structural Damage
- D. Functional Damage
- E. Disaster





# What is depicted below?

- A. Hazard
- B. Event
- C. Damage
- D. Disaster

