

The invisible link between the Sendai Framework for Disaster Risk Reduction and CTBT

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The Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015.

The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters.

The HFA was conceived to give further impetus to the global work under the International Framework for Action for the International Decade for Natural Disaster Reduction of 1989, and the Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action, adopted in 1994 and the International Strategy for Disaster Reduction of 1999.

TARGET A: Substantially **reduce global disaster mortality** by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015

TARGET B: Substantially **reduce the number of affected people globally** by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015

TARGET C: **Reduce direct disaster economic loss** in relation to global gross domestic product (GDP) by 2030

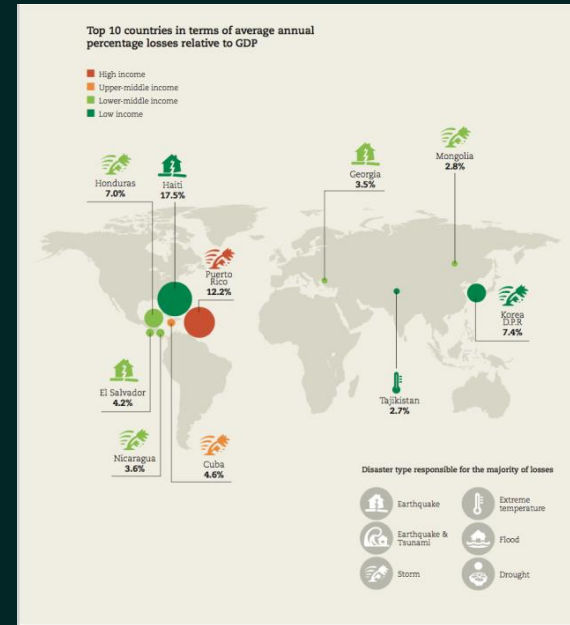
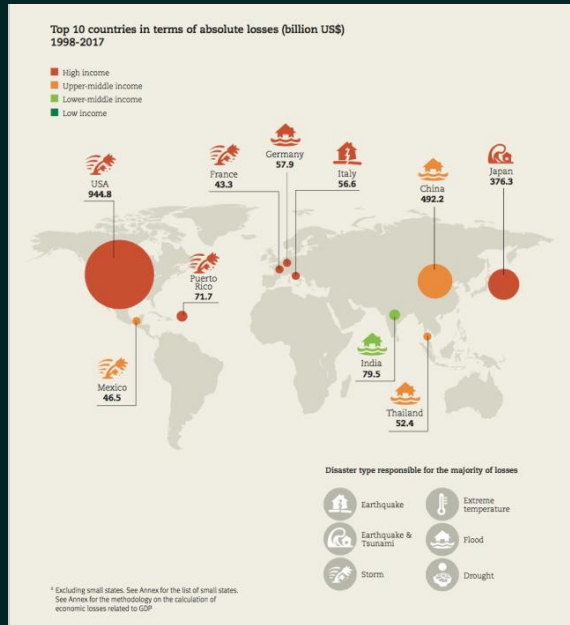
TARGET D: Substantially **reduce disaster damage to critical infrastructure and disruption of basic services**, among them health and educational facilities, including through developing their resilience by 2030

TARGET E: Substantially **increase the number of countries with national and local disaster risk reduction strategies** by 2020

TARGET F: Substantially **enhance international cooperation to developing countries** through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030

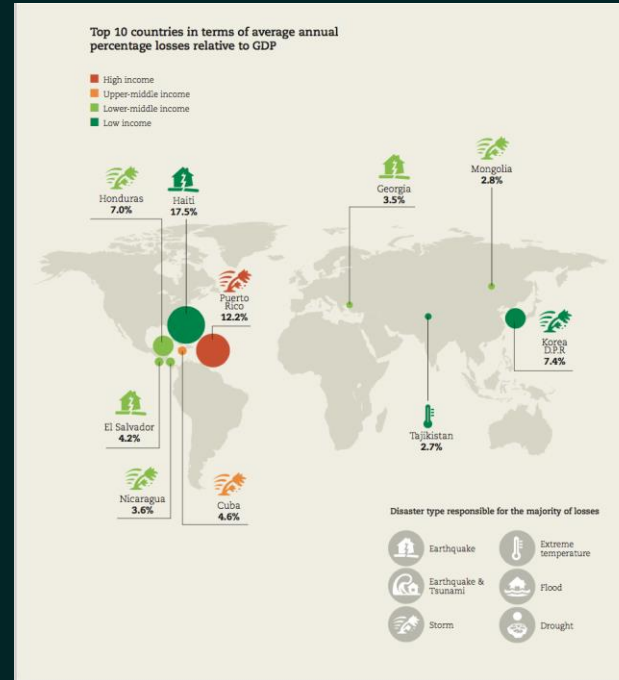
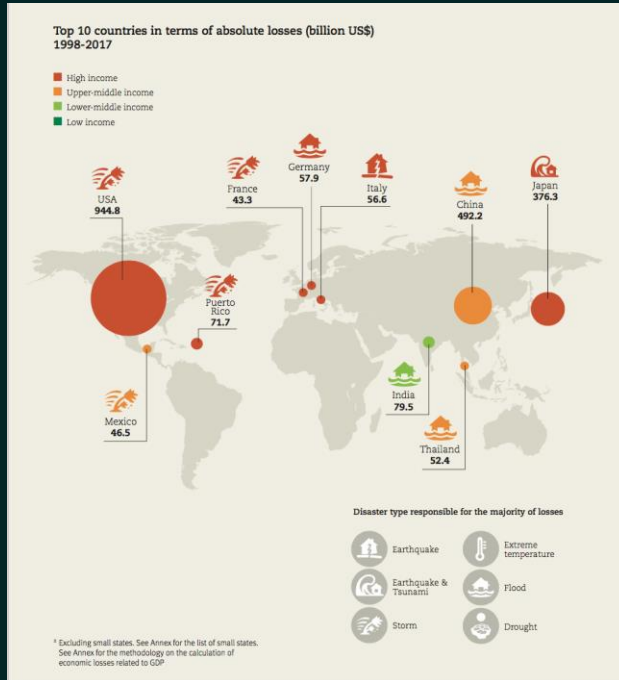
TARGET G: Substantially **increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people** by 2030

What do we talk when we talk about natural disaster risk reduction? We talk about global inequality...



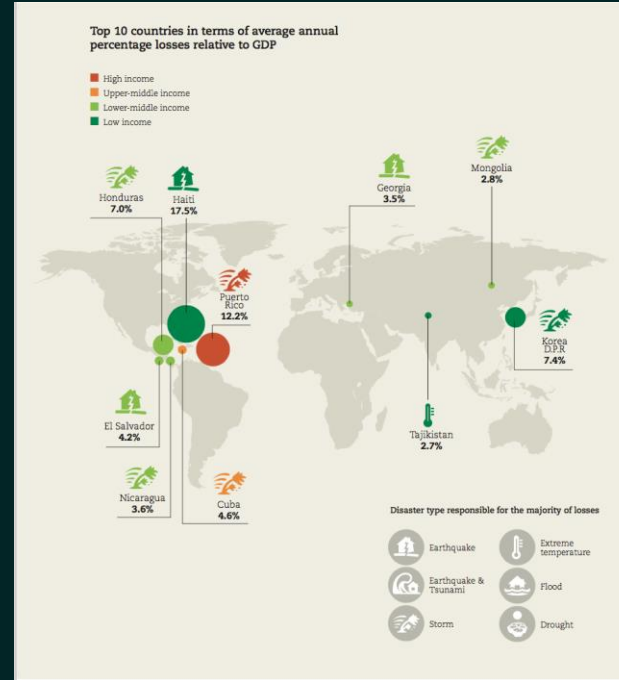
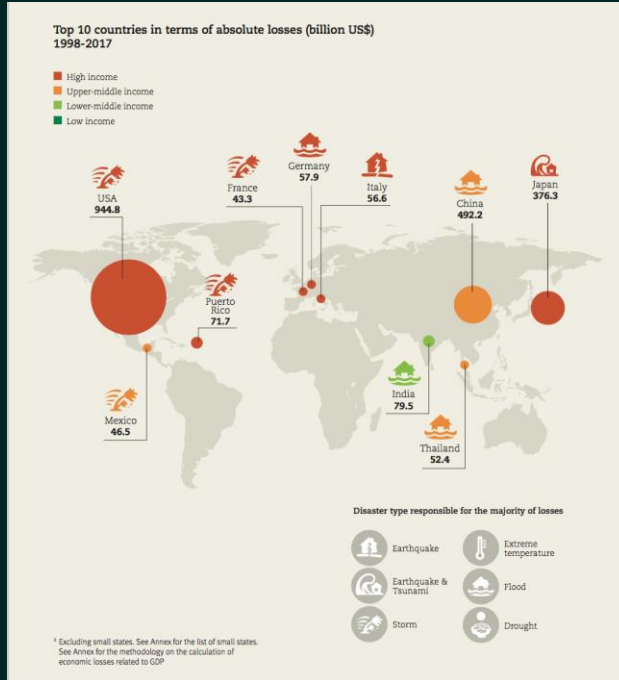
In 1998-2017 disaster-hit countries reported direct economic losses valued at US\$ 2,908 billion, of which climate-related disasters caused US\$ 2,245 billion or 77% of the total. This is up from 68% (US\$ 895 billion) of losses (US\$ 1,313 billion) reported between 1978 and 1997. Overall, reported losses from extreme weather events rose by 251% between these two 20-year periods.

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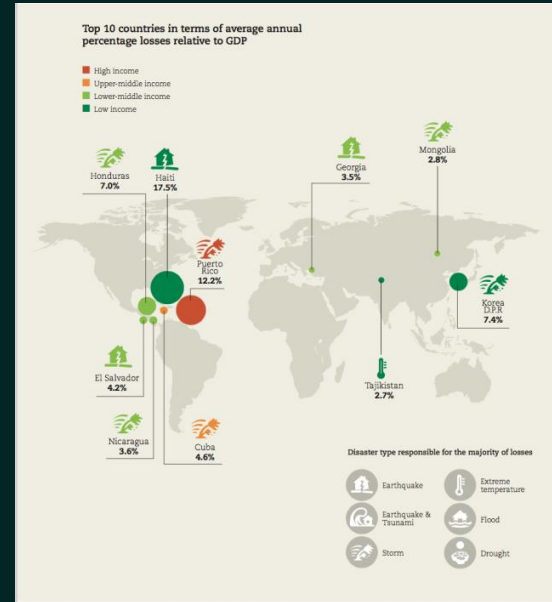
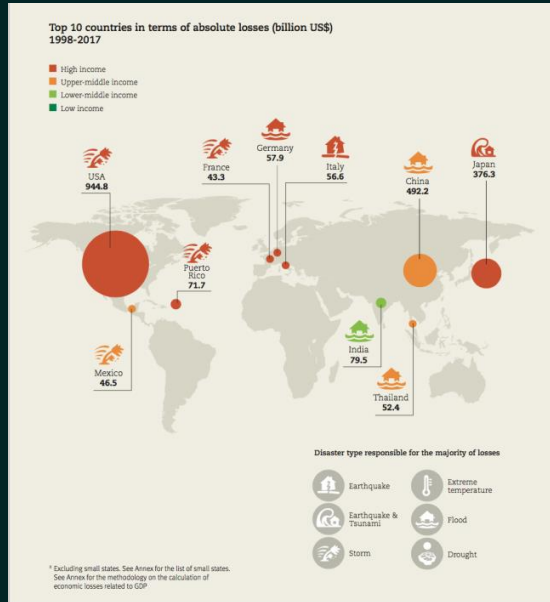
In absolute monetary terms, over the last 20-year, the USA recorded the biggest losses (US\$ 945 billion), reflecting high asset values as well as frequent events. China, by comparison, suffered a significantly higher number of disasters than the USA (577 against 482), but lower total losses (US\$ 492 billion).

What do we talk when we talk about natural disaster risk reduction? We talk about global inequality...



Such losses are only part of the story, since the majority of disaster reports contains no economic data. The World Bank has calculated that the real cost to the global economy is a staggering US\$ 520 billion per annum, with disasters pushing 26 million people into poverty every year.

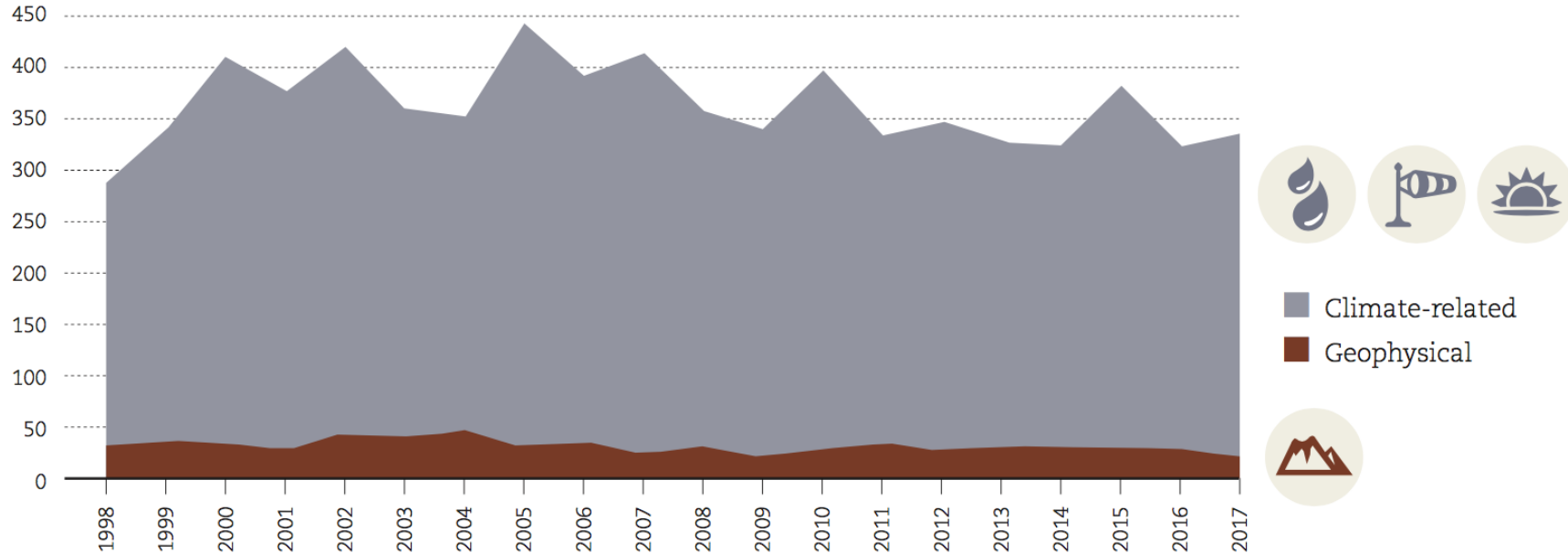
What do we talk when we talk about natural disaster risk reduction? We talk about global inequality...



Absolute losses also mask the relatively greater burden of disasters on the poor. When economic costs are expressed as an average percentage of Gross Domestic Product (GDP), this becomes clearer. Only one high income territory (Puerto Rico) ranked among the top 10 in terms of percentage of GDP losses over the past 20 years. Apart from upper-middle income Cuba, the other worst-hit nations were all lower income countries, led by Haiti.

What do we talk when we talk about natural disaster risk reduction? We talk about global inequality...

Number of disasters by major category per year 1998-2017

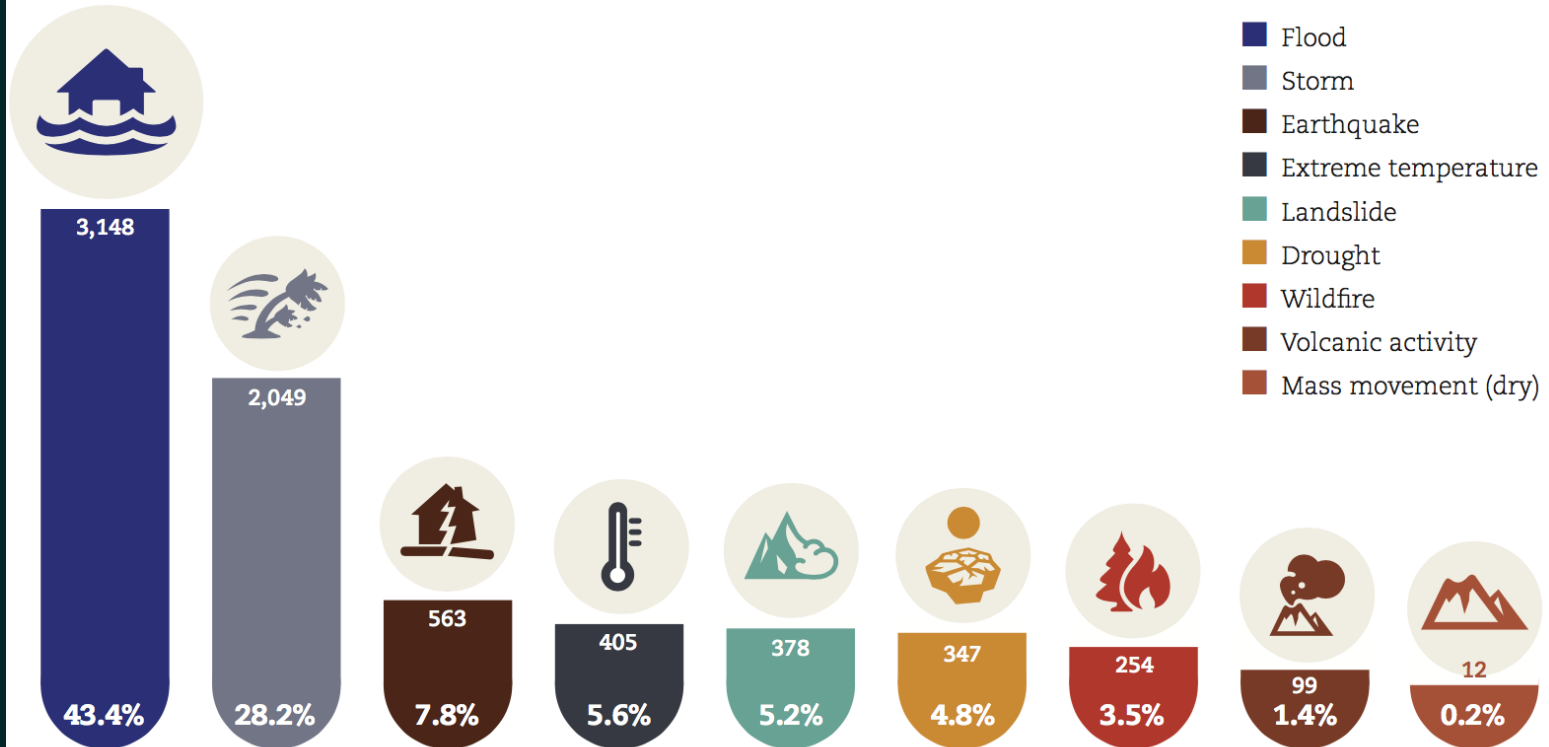


■ Climate-related
 ■ Geophysical

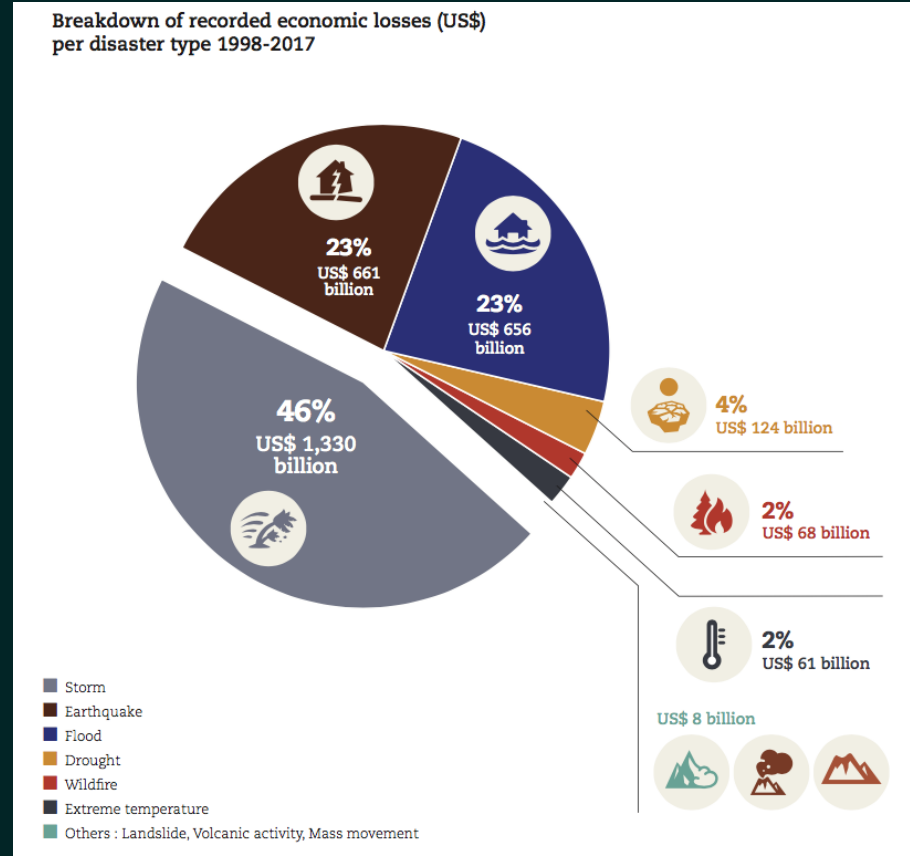
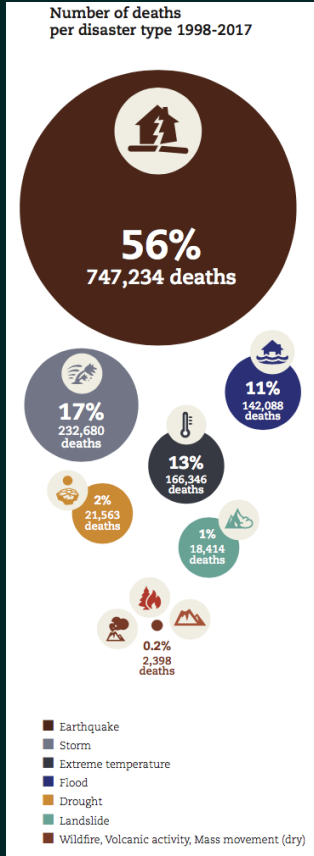
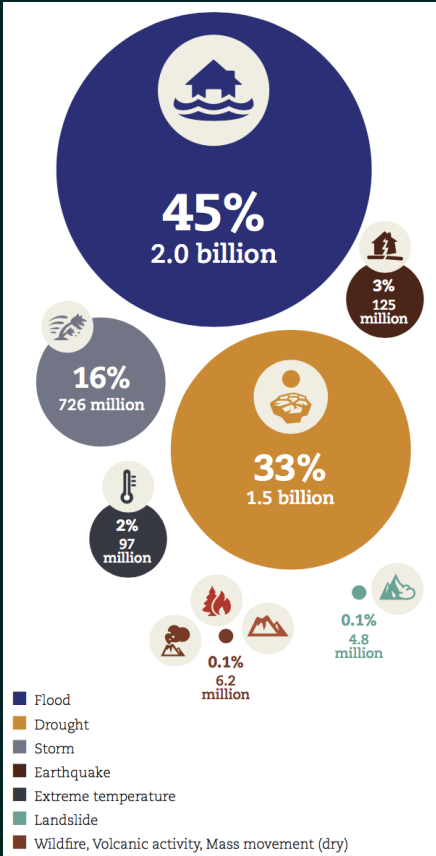


What do we talk when we talk about natural disaster risk reduction? We talk about global inequality...

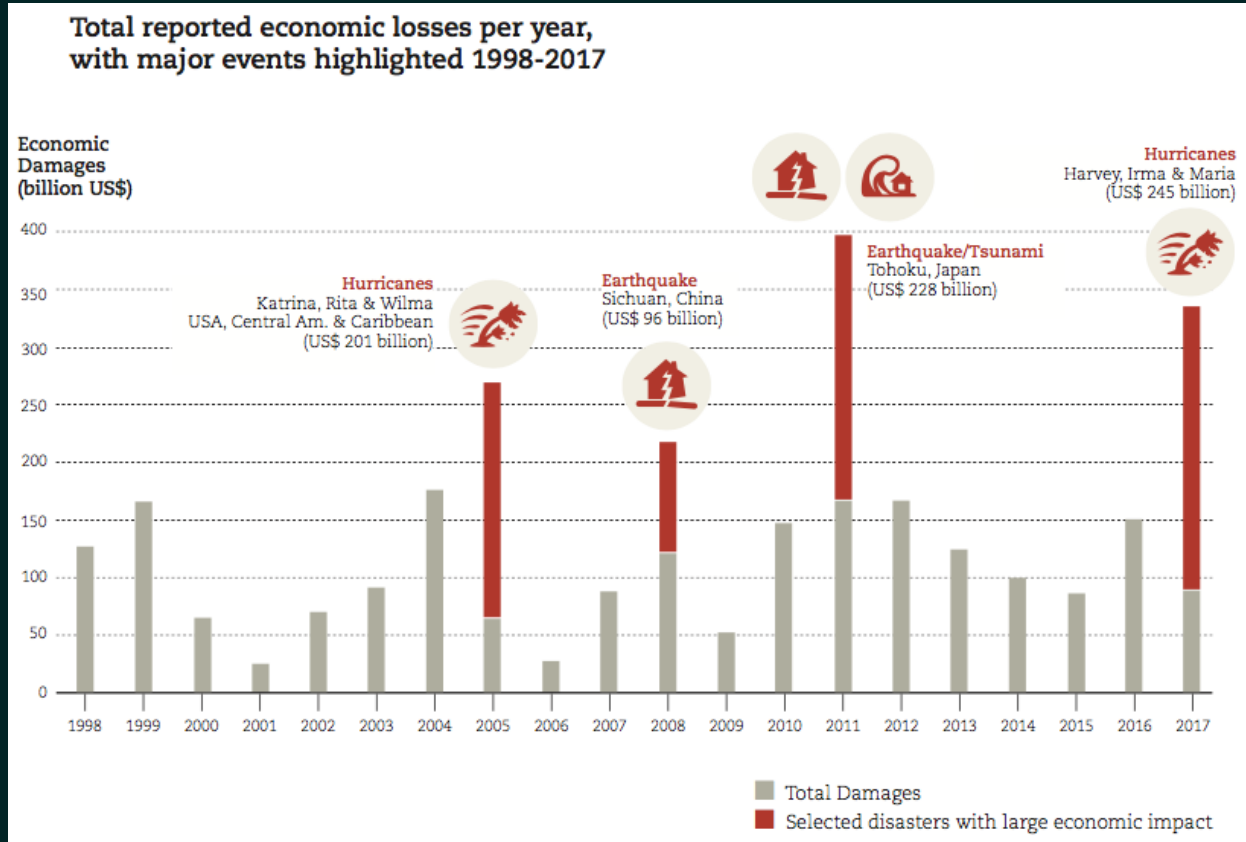
Numbers of disasters per type 1998-2017



What do we talk when we talk about natural disaster risk reduction? We talk about global inequality...



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Reporting of economic losses per income group (%)

	ALL	Climate-related	Geophysical
High income	53	52	61
Upper-middle income	40	40	37
Lower-middle income	31	30	31
Low income	13	13	20

Reporting of economic losses per continent (%)

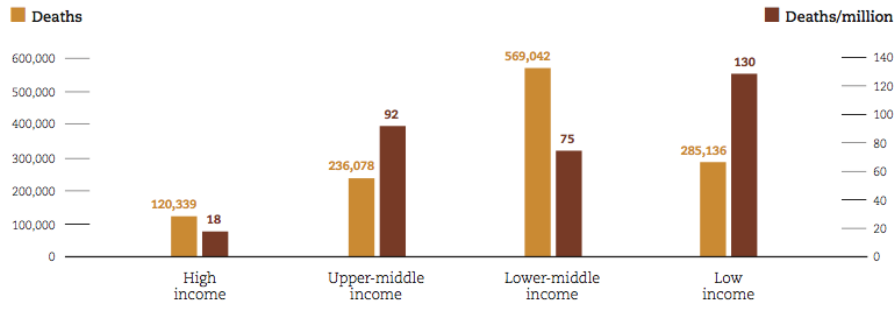
	ALL	Climate-related	Geophysical
Oceania	48	51	23
Americas	42	43	32
Asia	42	42	40
Europe	38	37	54
Africa	14	14	24

Inequality is even greater than available losses data suggest because of systematic under-reporting by low income countries. While high income countries reported losses from 53% of disasters between 1998 and 2017, low income countries only reported them from 13% of disasters. No losses data are therefore available for nearly 87% of disasters in low income countries.

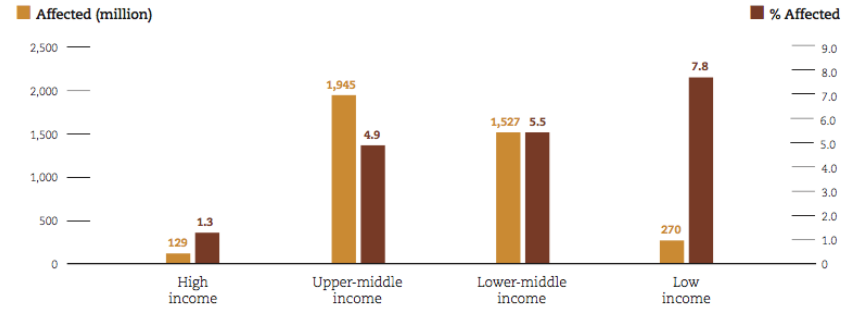
A similar divergence in record-keeping is evident geographically. Oceania recorded losses for 51% of climate-related disasters in 1998-2017; in Africa, the figure is just 14%. Thus the economic statistics are the tip of the iceberg as far as low income countries are concerned.

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Disaster deaths in absolute numbers per million population potentially exposed (PPE) 2000-2017



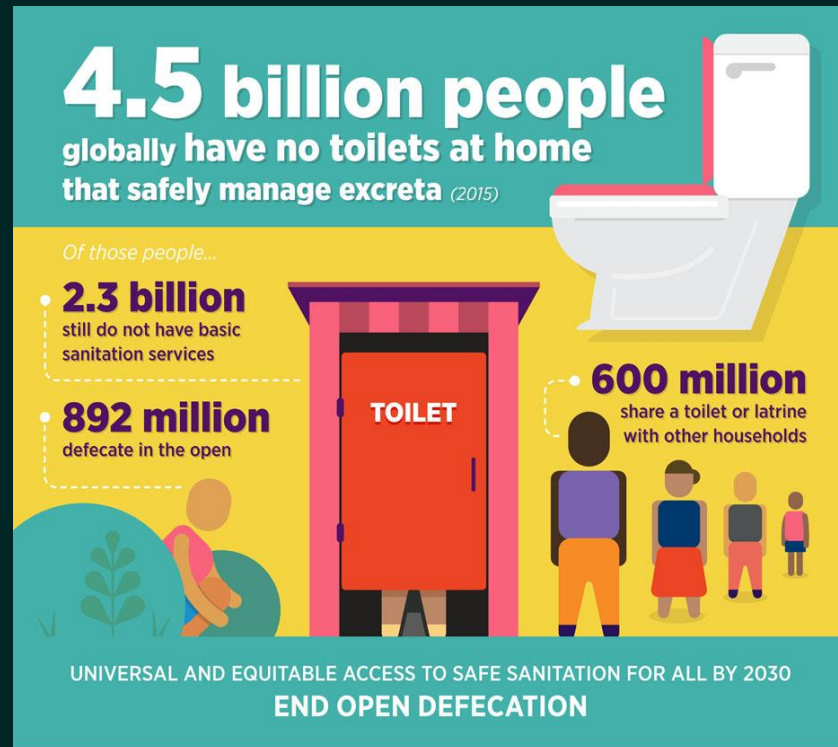
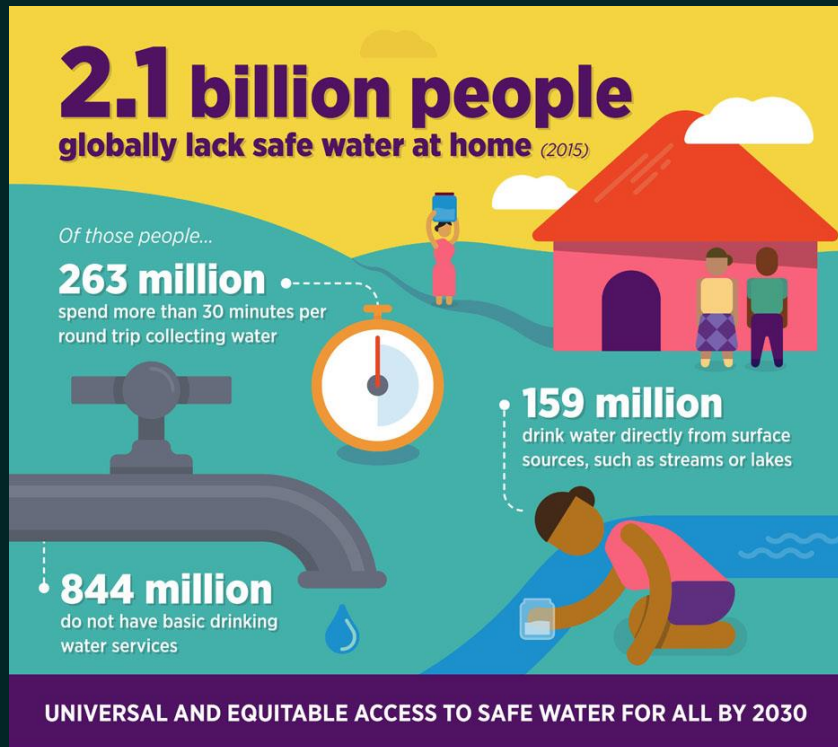
Disaster affected totals in absolute numbers and percentage of population potentially exposed (PPE) 2000-2017



For disasters since 2000, in low income countries, an average of 130 people died per million living in disaster-affected areas, compared to just 18 in high income countries. That means people exposed to natural hazards in the poorest nations were more than seven times more likely to die than equivalent populations in the richest nations.

A similar pattern of deep inequality is revealed by georeferenced ratios of people affected (but not killed) by disasters. While the largest absolute numbers of people affected by disasters lived in upper-middle income countries, by far the highest number per 100 inhabitants lived in low income countries. Again the contrast is sharpest between low income countries (7.8%) and high income countries (1.3%), meaning that people in the poorest countries were on average six times more likely than people in rich nations to be injured, to lose their home, be displaced or evacuated, or require emergency assistance.

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2004 Sumatra



2011 Tohoku





... initial blast of the 1883 Krakatu eruption sent a cloud of gas and debris an estimated up to 80 km into the air.

... pyroclastic flows up to 40 km at speeds of 100 km/h. Tsunami up to 30m.

...the eruption is estimated to have had the explosive force of 200MT of TNT (Hiroshima 15 KT)

...it is estimated that more than 36,000 people died.

...the explosions release an estimated 45 km³ of debris into the atmosphere, darkening skies up to 450km from the volcano...

... within 13 days, a layer of sulfur dioxide and other gases began to filter the amount of sunlight able to reach Earth.

...average global temperatures were as much as 1.2 degrees cooler for the next five years.



European Civil Protection and Humanitarian Aid Operations

EU Civil Protection Mechanism

What is it?

The overall objective of the EU Civil Protection Mechanism is to strengthen cooperation between Participating States in the field of civil protection, with a view to improving prevention, preparedness and response to disasters. Through the Mechanism, the European Commission plays a key role in coordinating the response to disasters in Europe and beyond.

When the scale of an emergency overwhelms the response capabilities of a country, it can request assistance via the Mechanism. Once activated, the Mechanism coordinates assistance made available by its Participating States.

Why is this important?

Disasters know no borders and can hit one or several countries simultaneously without warning. Having a well-coordinated joint response means that when national authorities are overwhelmed, they have one point of contact, rather than 34 to deal with. A joint approach further helps to pool expertise and capacities of first responders, avoids duplication of relief efforts and ensures that assistance meets the needs of those affected.

By pooling together the civil protection capacities and capabilities, it allows for a stronger and more coherent collective response. To date, all 28 EU Member States participate, as well as Iceland, Norway, Serbia, North Macedonia, Montenegro and Turkey. Since its inception in 2001, the EU Civil Protection Mechanism has responded to over 300 requests for assistance inside and outside the EU.

The Mechanism also helps to coordinate disaster preparedness and prevention activities of national authorities and contributes to the exchange of best practices. This facilitates the continuous development of higher common standards enabling teams to better understand the others' approach and work interchangeably when a disaster strikes.

How are we helping?

Following a request for assistance through the Mechanism, the Emergency Response Coordination Centre (ERCC), the operational hub of the Mechanism, mobilises assistance or expertise. The ERCC monitors events around the globe 24/7 and can ensure rapid deployment of emergency support through a direct link with national civil protection authorities. Specialised teams and equipment, such as forest firefighting planes, high-capacity water pumps, search and rescue, and medical teams can be mobilised at short notice for deployments inside and outside Europe.

Satellite maps produced by the Copernicus Emergency Management Service can also support civil protection operations. Copernicus provides timely and very precise geospatial information that is useful to delineate affected areas and plan disaster relief operations. Since 2012, Copernicus has provided over 2 000 delineation maps and 1 000 gridding maps to countries affected by disasters. Following the September 2018 earthquake and tsunami in Sulawesi, Indonesia, 18 separate maps helped the Indonesian authorities to assess inaccessible areas devastated by the tsunami. Whenever crises occur in developing countries, civil protection assistance typically goes hand in hand with EU humanitarian aid. Experts in both fields work closely together to ensure the most coherent analysis and response, particularly in response to complex emergencies.

EU Civil Protection in action

Any country in the world can call on the EU Civil Protection Mechanism for help and it has intervened in some of the most devastating disasters and complex emergencies. Examples include the Ebola outbreak in West Africa (2014) and in the Democratic Republic of the Congo (2018), the conflict in Ukraine (2014), the earthquake in Nepal (2015), the refugee and migration crisis in Europe (2015) and forest fires in the Mediterranean region (2017) and Sweden (2018).

European Civil Protection Pool

Participating States commit national resources for emergency response to the European Civil Protection Pool. This pool allows for better planning and coordination of response activities at European and national levels and thereby contributes to a faster and reliable EU response to disasters.

Prevention and preparedness

Prevention and preparedness activities mitigate the effects of disasters on lives, property and the environment. Well-trained teams are more effective in responding to disasters. A training programme for Participating States' civil protection experts ensures compatibility and complementarity between intervention teams, while large-scale exercises such as MDEX 2018 train capacities for specific disasters each year.

The European Commission supports and complements prevention and preparedness efforts of Participating States by focusing on areas where a joint European approach is more effective than separate national actions. These include risk assessments to identify the disaster risks across the EU, encouraging research to promote disaster resilience and reinforcing early warning tools.

resEU: Strengthening the EU emergency response in times of crises

In March 2019, the EU strengthened all components of its disaster risk management to better protect citizens from disasters. The upgraded EU Civil Protection Mechanism established a new European reserve of capacities (the 'resEU reserve') that initially includes firefighting planes and helicopters. Through the strengthened Mechanism, the EU is setting the basis to be better prepared and respond to other emergencies in the future, such as medical emergencies, chemical, biological, radiological and nuclear emergencies.

To ensure that Europe is prepared for forest fire season, the new legislation foresees a transition phase during which Participating States can get funding in exchange for putting their firefighting means at the disposal of the EU.



ARISTOTLE-ENHSP provides a flexible and scalable **24*7 Multi-Hazard Service** for the European Commission's ERCC.

ARISTOTLE-ENHSP translates **complex scientific information** into **actionable advice** for the EU's Disaster Management professionals.

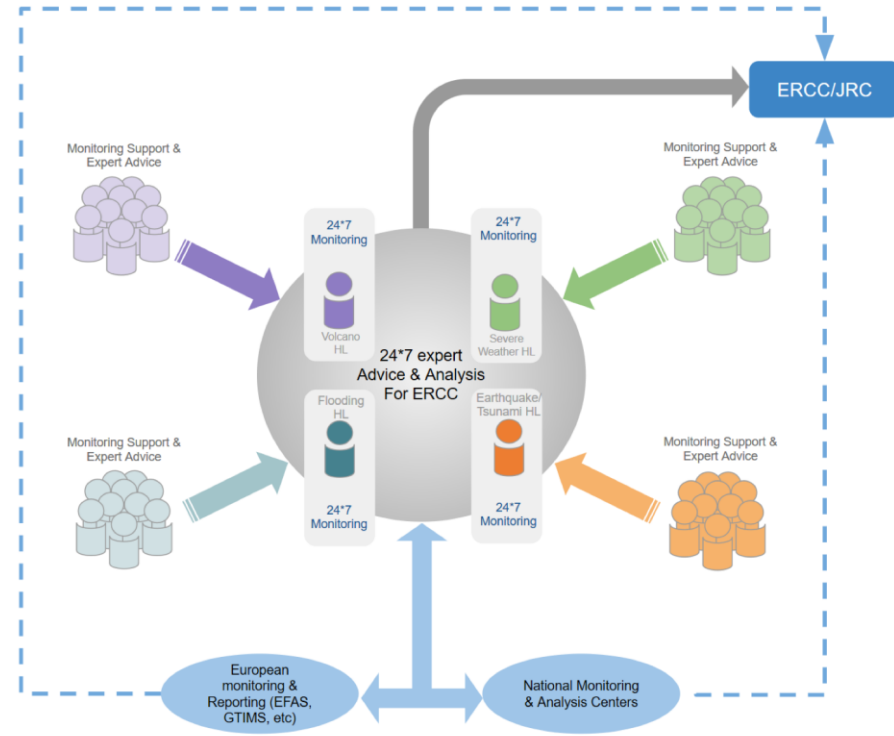
The **ARISTOTLE-ENHSP Partnership** works with colleagues from across the **Disaster Management and Science portfolio** to ensure the service continues to assimilate the best that our complex and challenging arena can deliver



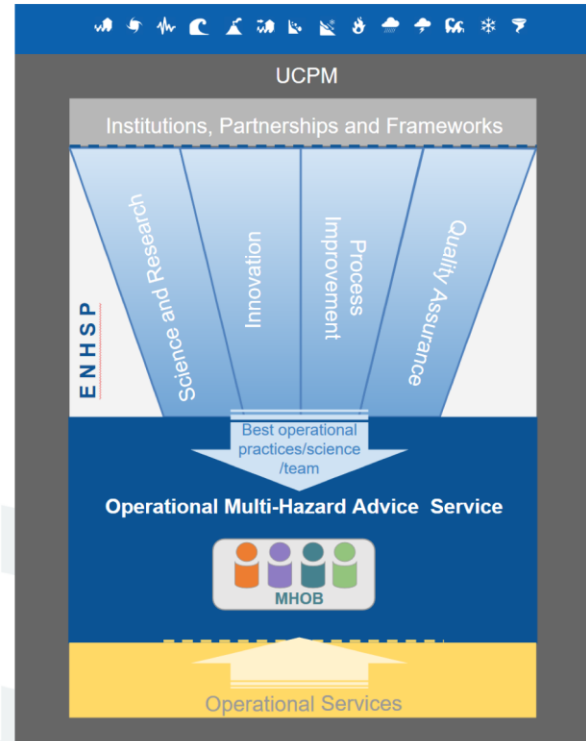
MH 24/7 Operational Service



Operational system as a simple concept



Development feeding into operations



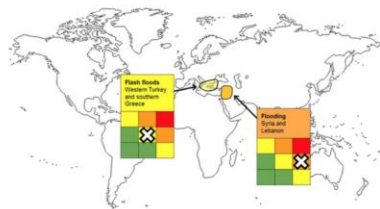
– ARISTOTLE WEEKLY SINGLE HAZARD MONITORING REPORT –

Area: <input checked="" type="checkbox"/> EUROPE and CENTRAL ASIA <input type="checkbox"/> NORTH AMERICA <input type="checkbox"/> ASIA and OCEANIA <input type="checkbox"/> LATIN AMERICA and CARIBBEAN <input checked="" type="checkbox"/> MIDDLE EAST and NORTH AFRICA <input type="checkbox"/> SUB-SAHARAN AFRICA	Type of report: <input checked="" type="checkbox"/> Weekly Situational Report <input type="checkbox"/> Emergency Report (+3H)
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Reporting Date: 11th January 19 Time: 1100 (UTC)

Geographical location

Risk map of events with impacts at "Monitor" assessment level or higher



The level is at **Prepare (Medium Likelihood Impact, International Resources)** today for Syria and Lebanon.

Syria and Lebanon: There are ongoing riverine floods in Lebanon, Syria and other neighbouring countries like Turkey due to heavy precipitation.

The maximum peak in Lebanon has passed (Wednesday January 9) and the discharge went below the 20 year return period level yesterday (Wednesday January 10) (Figure 2). It will take until Saturday January 12 before the discharge expects to go below the 5 year return period level in the area.

Peak discharge in Syria has passed in some parts of Syria (Figure 3) or is expected to peak today (January 11) (Figure 4).

There are some indications of higher flows at the end of next week (see figures below), but the forecasts are uncertain. The area needs to be monitored closely in the upcoming days.

Since the region is near or on the edge of the EFAS domain and the model is not calibrated in this area the uncertainties are large. The hydrological model uncertainties are larger than in other, more represented areas of EFAS (where streamflow observations are available and model calibration can be done regularly).

Our current assessment is that this event should be raised to a higher level than Monitor (**Prepare level, medium likelihood, international resources**). The reason for keeping it at an international level even though the peak flow has passed in most places is that the flooding is still ongoing. The reason for a medium likelihood for an ongoing event is that the impacts are very uncertain due to few observations and uncalibrated models.

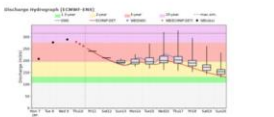
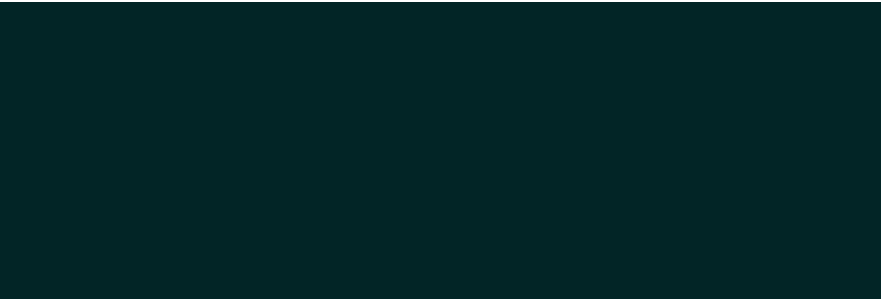


Figure 2: The EFAS forecast discharge in a coastal basin in Lebanon 00UTC Friday 11th 2019.



ARISTOTLE 2 - Severe Weather Group



ARISTOTLE 2 - Severe Weather Group

Global Weather Impacts – Monday 24th to Sunday 30th June 2019

Issued on Monday 24th June 2019

HEADLINES

- Heat wave developing across W/Central Europe; accompanied by thunderstorms in the far W.
- Heavy rain/thunderstorms NE India, N Bangladesh extending eastwards across China.
- Potential for weak tropical cyclones in both east and west Pacific Ocean.

Aristotle Impacts Summary – 24 Jun 2019 to 30 Jun 2019



DISCUSSION

There are no tropical cyclones currently, but the following areas are being monitored for potential development:

Western North Pacific

Weather

There continues to be a small signal for weak tropical cyclone development in the West Pacific. Latest data indicates that there is now little or no threat to eastern Luzon however, with associated zone of showers and thunderstorms expected to curve away to the north and stay offshore in the short term. The system may eventually form a sub-tropical low which could further enhance rainfall across southern and south-western Japan later this week. (See Asia sector below)

Expected Impacts

See Asia sector below.

Eastern North Pacific Ocean

Weather

There is a moderate chance that one or more weak tropical cyclones may form along the Inter-tropical Convergence Zone, over the East Pacific early next week. Any system that does form is not expected to affect land.

Expected Impacts

Nil.

Europe

Western Europe

Temperatures 10°C to very locally 15°C above average are expected to develop through this week, peaking most widely on Wednesday/Thursday before a gradual cooling takes place from the north and east of the region highlighted. Maxima into the mid 30s of Celsius are expected, with some places seeing high 30s to low 40s of Celsius, more especially across France and Spain towards the end of the week. Overnight minima may not fall below 20°C in a few places. National June temperature records are likely to fall, but the building heat will also be accompanied by locally severe thunderstorms in the far west of the region during the first part of this week.

Expected Impacts

High temperatures will bring heat health impacts to vulnerable populations, particularly given the spell of very warm nights (minima >20°C), whilst placing strain on some utilities and transport networks (e.g. railways). In addition, some places may see strong winds which could lead to an increased threat of wildfires. Where severe convection develops, heavy rainfall, lightning and large hail are all possible.

Parts of Southeast Europe

Weather

With the heat building across Western Europe thunderstorms associated with a moist and unstable airmass over southeast Europe will slowly become displaced further east and southeast over the coming days, with evening rising. Thunderstorms will tend to occur more broadly across south-east Europe at first; the area highlighted is expected to see the most severe and long-lived storms with the potential for an excess of 50mm of rain in 2-3 hours. Large hail, gusty winds and very isolated tornadoes are also possible, however, even within this area many places will stay predominantly dry. By the middle of the week, the weather will become more settled.

Expected Impacts

Localised flash flooding along with power outages and disruption to the transport networks (especially aviation) is possible. Strong wind gusts and large hail may cause localised disruption to transport and damage to crops, some buildings and vehicles.

North America

Central and Southern Plains, USA

Weather

Strong to severe thunderstorms with the potential for large hail and damaging, locally destructive winds are expected to continue over the next couple of days. As well as these hazards, the storms will bring locally torrential rainfall, with in excess of 100 mm possible in a few hours in one or two locations. Thunderstorm activity will become much more isolated and much less severe from Wednesday.

Expected Impacts

Localised flash flooding along with power outages and disruption to the transport networks (especially aviation) is possible. Strong, locally damaging wind gusts impacting property and infrastructure, whilst large hail has the potential to cause damage to crops, some buildings and vehicles.

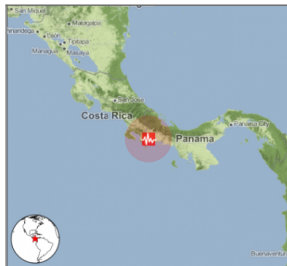
ARISTOTLE-ENHSP EMERGENCY REPORT (AR0027)

EARTHQUAKE IN PANAMA (AND COSTA RICA)

MAIN DETAILS			
Area	Panama (North America)	Operation mode	Reactive
Event start	26 June 2019, 05:23 UTC	Event end	-
Report created	26 June 2019, 07:00 UTC	Report finalized	26 June 2019, 09:17 UTC

EXECUTIVE SUMMARY

- A STRONG earthquake with magnitude 6.2 occurred on Wed Jun 26 05:23:50 2019 (UTC) with latitude 8.45°N, longitude -82.77°E and depth of 26.2 km. This is an inland event at a distance of 14.5 km from the nearest coast.
- GDACS reported ORANGE alert level with an exposed population of 690k people within 100 km. Coping capacities for Panama and Costa Rica are 4.1 and 2.7, respectively. PAGER reported a YELLOW alert level for shaking-related fatalities and economic losses. It is very unlikely for this earthquake to have caused severe damage close to the epicenter. However, landslide damage or fatalities are still possible in highly susceptible areas (none reported until now).
- Within few minutes after the earthquake, a series of aftershocks between magnitudes 2.7 and 5.1 occurred. In almost 30 minutes, the National Seismic Network recorded, at least, 10 aftershock which were strong enough to be felt, especially in the southern zone of Costa Rica and northern area of Panama.
- The number of reported injured so far is 5 on the Panama side.
- Alexander Solís, president of the National Emergency Commission (CNE) in Costa Rica declared minutes after the earthquake: "We have no damage to regret. In terms of material damage, two homes have been affected but no personal injuries or victims". However, minutes after the earthquake, the Costa Rican Electricity Institute confirmed that there was a reported impact on electric service in communities of the southern area of Costa Rica.
- The possibility of a tsunami on the coasts of Costa Rica or Panama close to the epicenter are ruled out.
- There will be an increasing likelihood of heavy showers and thunderstorms for Panama and Costa Rica from Thursday through to Monday.
- International cooperation is unlikely to be needed for this event.



GEOGRAPHICAL LOCATION			
PANAMA-COSTA RICA BORDER REGION:			
8.45 -82.77			
Magnitude 6.2, depth 26 km			
OVERALL IMPACT			
Medium			
LACK OF COPING CAPACITY			
Panama	LOW	(4.1)	
Costa Rica	VERY LOW	(2.7)	
ALERT LEVEL			
Likelihood of major impact	High		
	Medium	X	
	Low		
Required Resources	Sub-national	National	Inter-national

ARISTOTLE 2-ENHSP EMERGENCY SITUATIONAL REPORT

VOLCANIC ERUPTION

MAIN DETAILS			
Area	Italy (Europe)	Operation mode	Reactive
Event start	24 December 2018, 10:00 UTC	Event end	ongoing
Report created	25 December 2018, 10:20 UTC	Report finalized	25 December 2018, 10:35 UTC

EXECUTIVE SUMMARY

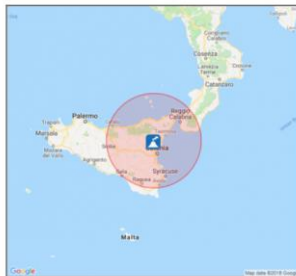
Current situation

The current eruptive activity started on July 2018 with moderate intra-crater explosive activity and isolated episodes of lava flow at the summit crater of the volcano. This eruptive style suddenly increased in intensity at 10:00 UTC of 24 December 2018 preceded by an increase of seismic tremor. Eruptive activity generated a strong explosive regime coupled with a lava flow confined to the summit of the volcano. An ash column spread up to about -6-7 km a.s.l above the summit of the volcano.

Since, late afternoon of the 24th of December explosive activity strongly reduces in intensity and lava flow are not active. Mild ash emission is released and dispersed proximally to the summit crater. Ongoing seismic activity with earthquakes located in the summit south-ester flank of the volcano at a mean depth of 2-3 km.

Possible evaluation

- Both volcanic tremor and seismic activity remains still at medium-high level
- Eruptive regime decreased in early December but a sudden renew of the explosive style and lava flow cannot be excluded.
- Based on forecast ash dispersal, a renew of the eruptive activity could generate a volcanic dispersing toward South-East of the volcano.
- Potential closure of Catania Airport



GEOGRAPHICAL LOCATION			
Etna, ITALY: 37.75 15.00			
OVERALL IMPACT			
Low/Medium/High			
LACK OF COPING CAPACITY			
Italy	VERY LOW	(2.3)	
ALERT LEVEL			
Likelihood of major impact	High		
	Medium	X	
	Low		
Required Resources	Sub-national	National	Inter-national

ARISTOTLE-ENHSP EMERGENCY REPORT (AR0020)

TROPICAL CYCLONE FANI

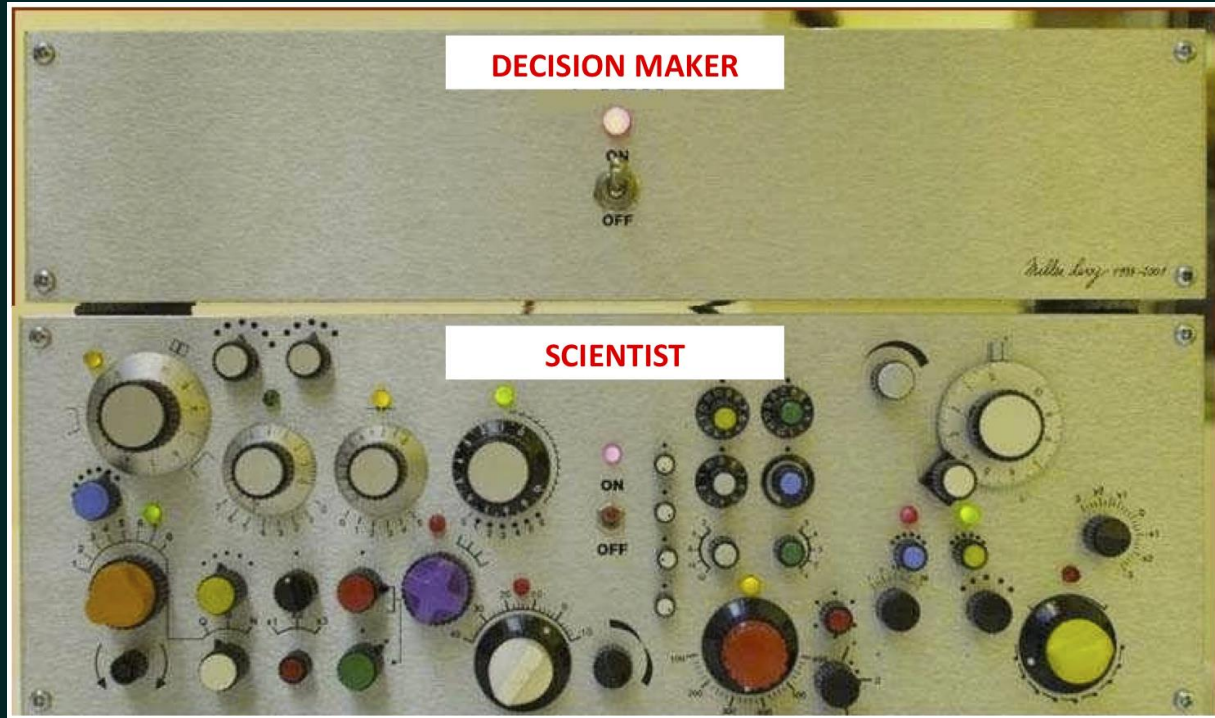
MAIN DETAILS			
Area	India (Asia)	Operation mode	Proactive
Event start	2 May 2019, 12:00 UTC	Event end	4 May 2019, 12:00 UTC
Report created	1 May 2019, 11:19 UTC	Report finalized	1 May 2019, 13:38 UTC

EXECUTIVE SUMMARY

- Tropical Cyclone Fani is currently located around 950 km to the south-southwest of Kolkata, India. It is currently an extremely severe cyclonic storm and is expected to make landfall on the Odisha coast between Chatrapur and the southern Mahanadi River Delta on Friday 3 May around 0600 UTC.
- Destructive winds prior to landfall of around 180 km/h with higher gusts are equivalent to Category 3 on the Saffir-Simpson hurricane wind scale and when combined with a storm surge and heavy rainfall will mean the most significant impacts are expected along the Odisha and West Bengal coast if eastern India.
- Low-lying areas of the north Bay of Bengal coast will be exposed to coastal flooding due to a storm surge affecting a wider region which will typically range from 1-2m as far east as Chittagong, Bangladesh.
- Since it is the end of the dry monsoon season, major river flooding is not expected due to heavy rainfall associated with Fani.
- The nearest major town to landfall and most exposed to destructive winds is Puri, Odisha with a population of around 200,000 (2011). The most recent tropical cyclone to affect this region was Tropical Cyclone Phailin (October 2013) Glide n° TC-2013-000133-IND.



GEOGRAPHICAL LOCATION			
EASTERN INDIA: 20.31 85.58			
OVERALL IMPACT			
Medium			
LACK OF COPING CAPACITY			
India	LOW	(4.5)	
ALERT LEVEL			
Likelihood of major impact	High	X	
	Medium		
	Low		
Required Resources	Sub-national	National	Inter-national



The invisible link between the Sendai Framework for Disaster Risk Reduction and CTBT is

the Civil and Scientific Use of CTBTO Data and Expertise

TARGET F: Substantially **enhance international cooperation to developing countries** through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030

TARGET G: Substantially **increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people** by 2030



44 States



152 States

By promoting the civil and scientific applications of the verification Technologies, the CTBTO will optimize its Capacity Building program to ensure sustainability of the NDCs of non-nuclear weapon State Signatories.