IMPACT-BASED FORECASTING

DOST-PAGASA

Global and Asian Perspective on Impacts

WMO PTC/GCC Workshop on Impact-based Forecast and Warning Services,
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Aim

- To explore the most relevant hazards that affect the region, its associated impacts and how they are reported

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“Extreme weather events will happen. But they do not need to become deadly disasters.”

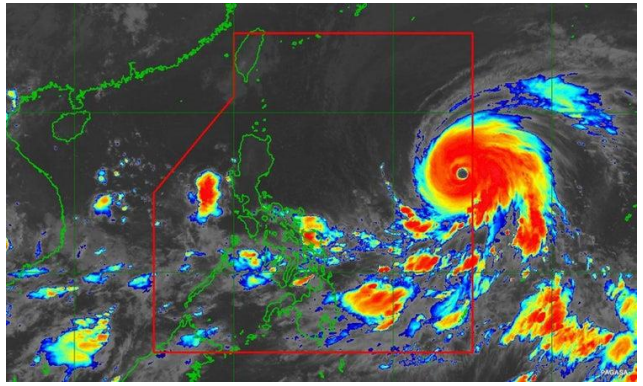
António Guterres, Secretary-General of the United Nations (October 2022)

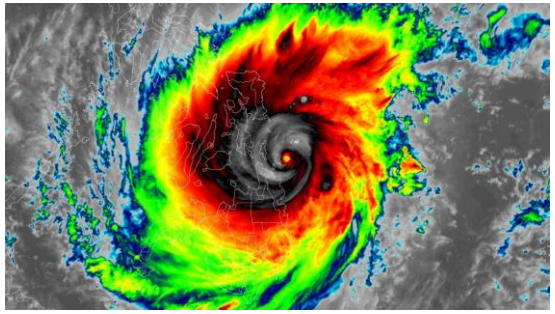
Hazard

- The potential occurrence of a natural or human-induced physical event or trend or physical impact that ***may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources***. (WMO)

- 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, or environmental damage. (UNISDR)

Hazard-examples





Disaster

- 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. (UNISDR)

- Severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery. (WMO)

Impacts of the most relevant hazards

Match the hazard/weather type to the image of its impact

Hazard/Weather Types:

Tidal surge/ Tsunami

Strong Winds

Lightning

Tropical Cyclone

Impacts-examples

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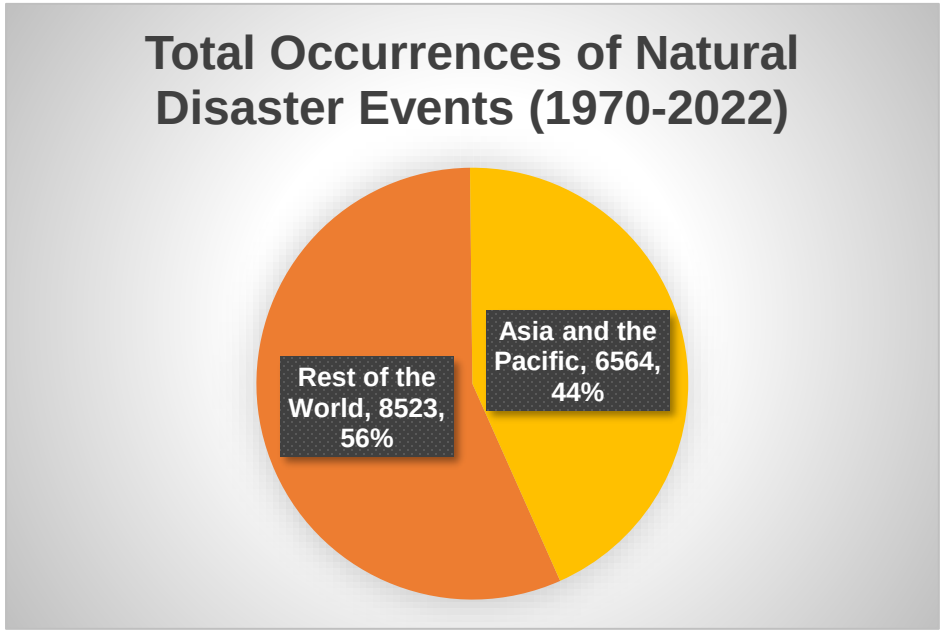
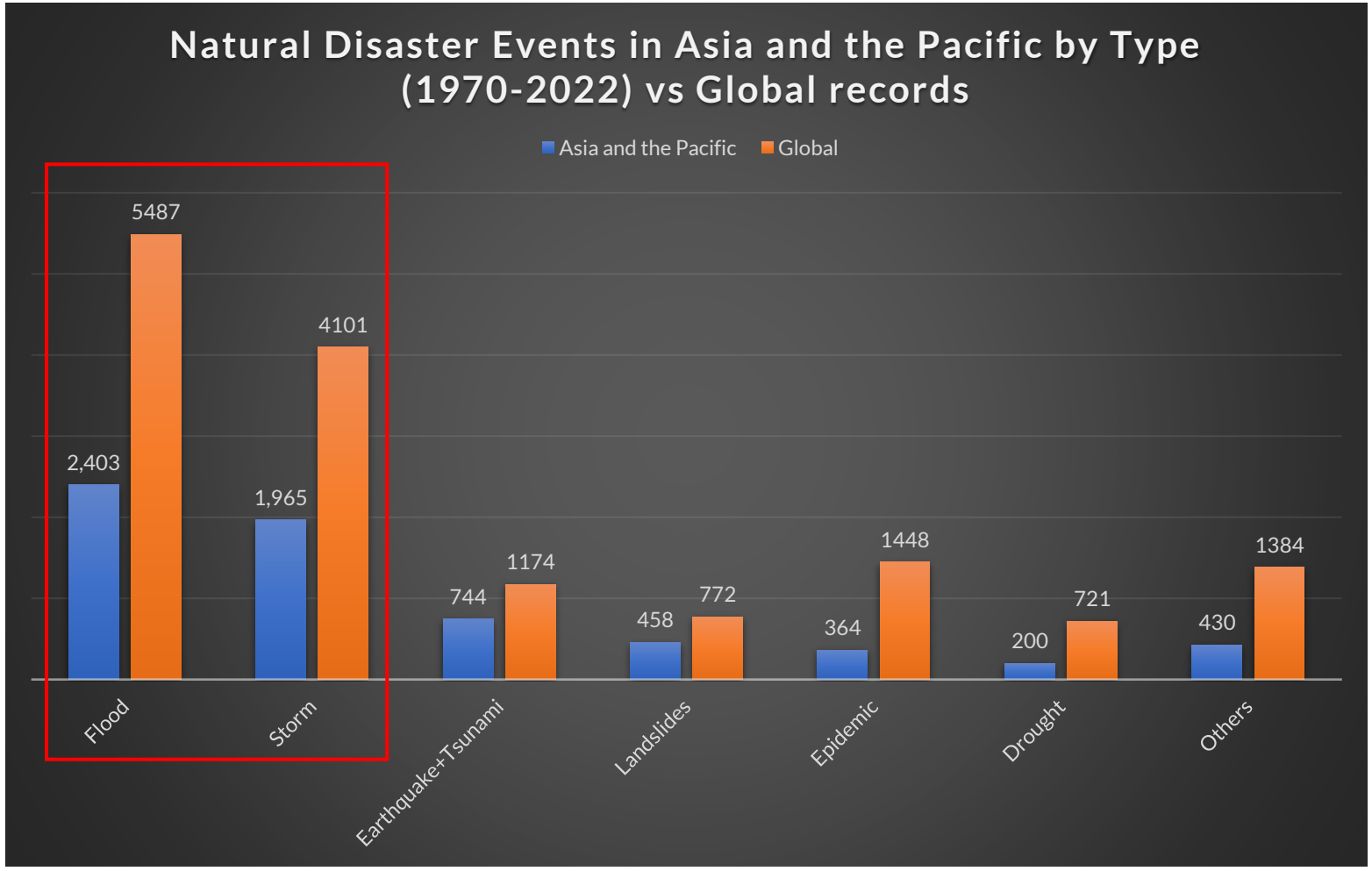
Natural Disasters-Overview

What causes the impacts?

Global Natural Disasters- Overview

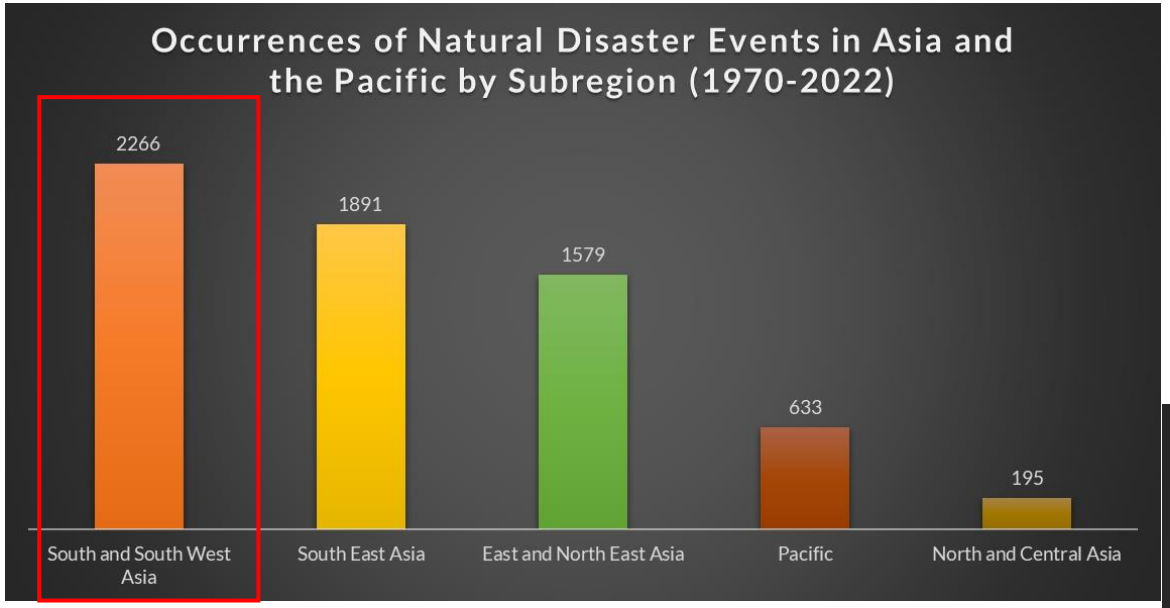
- The world reported a total of 15,087 natural disaster events from 1970-2022
- Flood and storms were the most frequent





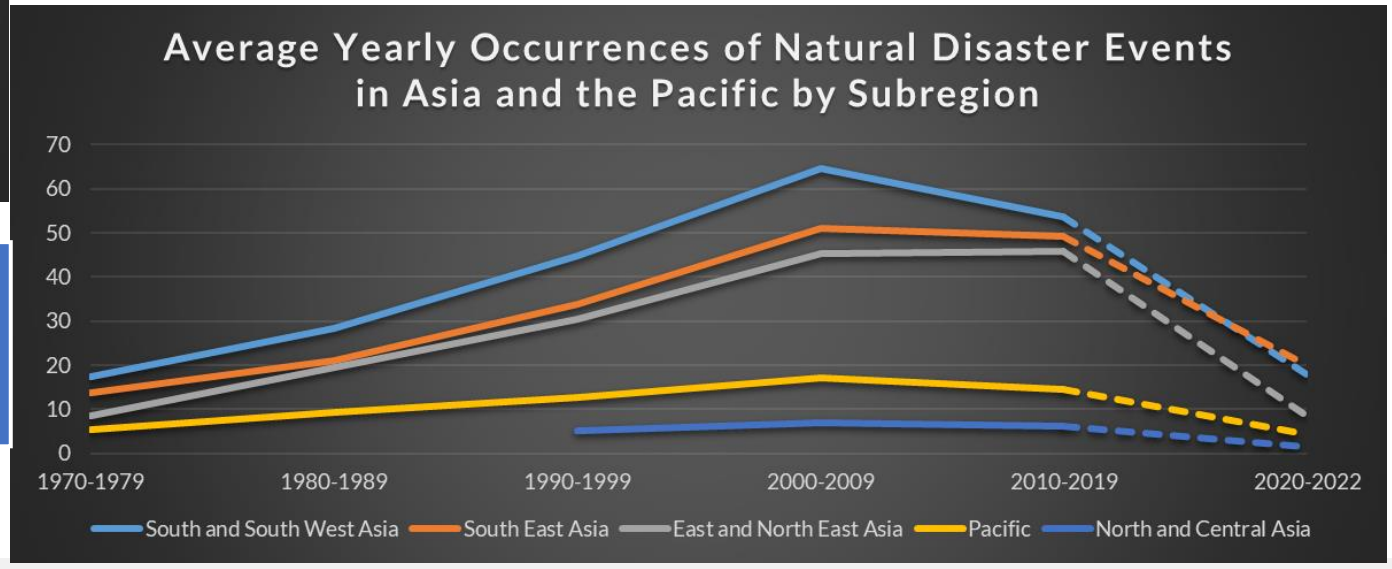
Data source for all figures and tables is EM-DAT, The OFDA/CRED International Disaster Database - www.emdat.be [accessed on 23 October 2023]

Asia and the Pacific- Natural Disasters



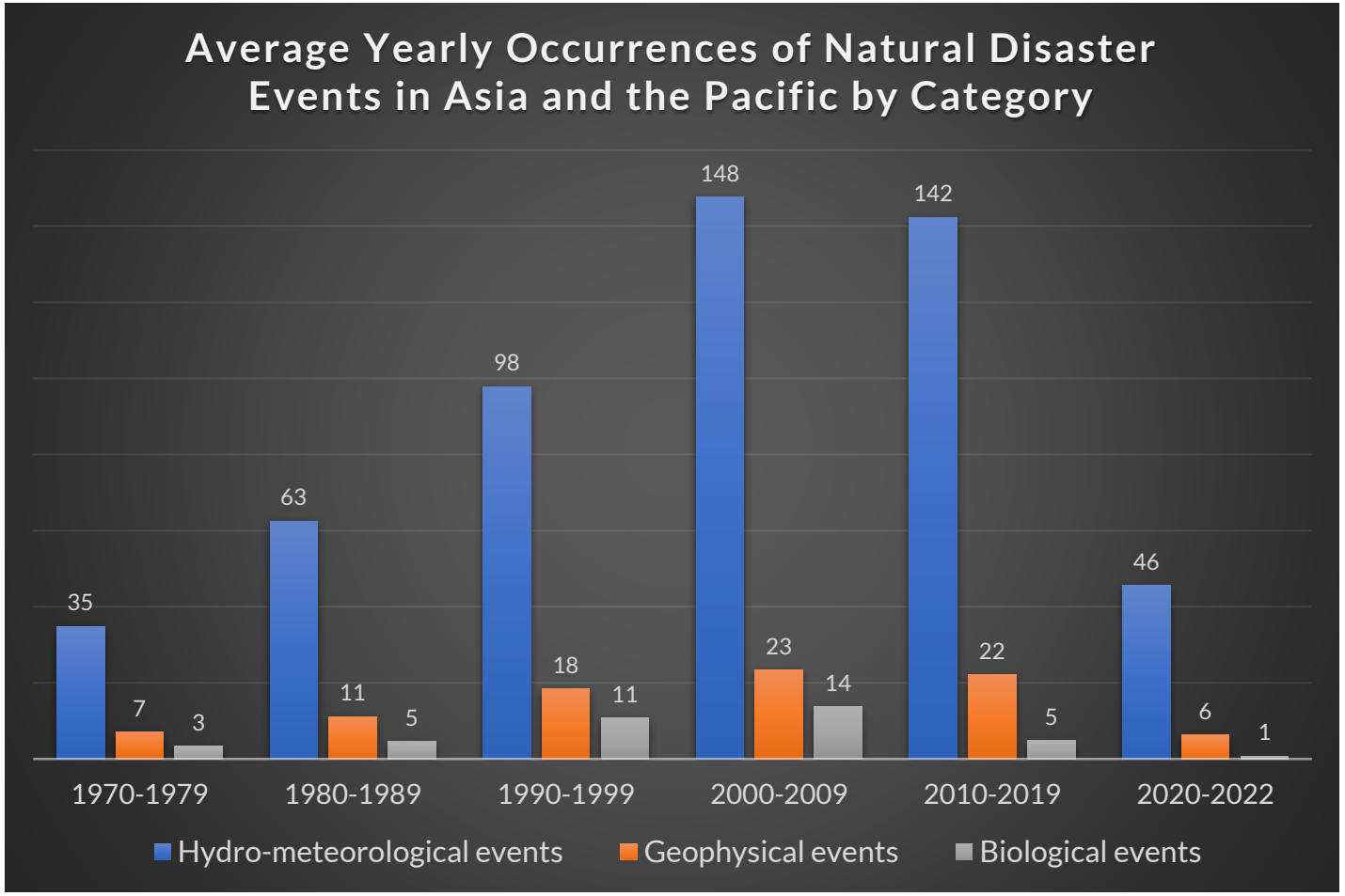
- Asia and the Pacific are among the most disaster-prone regions in the world - takes up almost half of the total natural disaster events
- The region takes up only 30% of the world's landmass but receives disproportionately higher disaster impacts

- South and South West Asia had the largest number of natural disaster events
- Increasing frequency of disaster reports since 1970

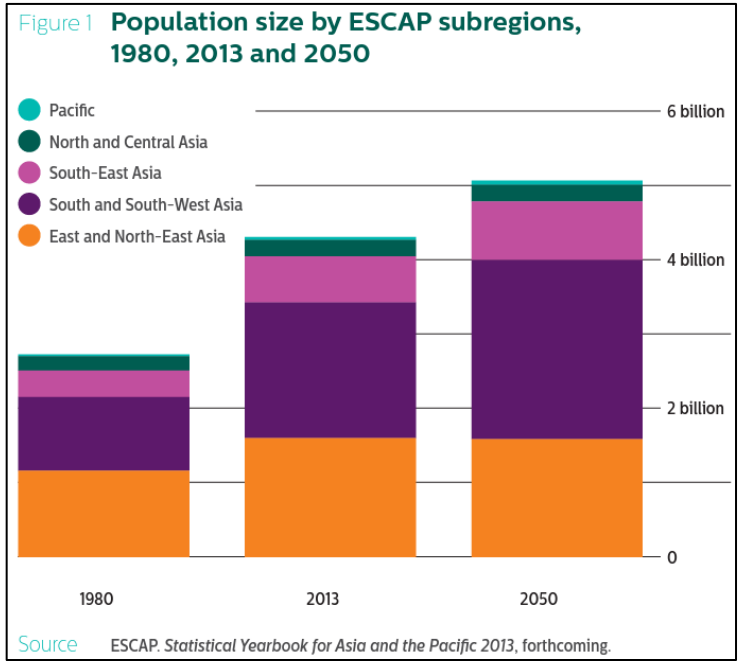


Data for North and Central Asia is from 1990 to 2022.
Each period in the figure represents yearly average of respective decade, but the last period represents yearly average of recent 3 years from 2020 (dashed lines).

Asia and the Pacific- Natural Disasters



- Number of hydrometeorological disasters doubled from 63 per year in 1980-1989 to 148 per year in 2000-2009
- Double in population from 1980 to 2013



Asia and the Pacific- Risk Index*

Rank	Country	Risk
1.	Philippines	46.82
2.	India	42.31
3.	Indonesia	41.46
4.	Colombia	38.37
5.	Mexico	37.55
6.	Myanmar	35.49
7.	Mozambique	34.37
8.	China	28.70
9.	Bangladesh	27.90
10.	Pakistan	26.75
11.	Russian Federation	26.54
12.	Vietnam	25.85
13.	Peru	25.41
14.	Somalia	25.07
15.	Yemen	24.26

- 10 out of the top 15 countries with the highest disaster risk worldwide is part of Asia and the Pacific

Figure 4: The WorldRiskIndex and its spheres

Most common hazards:

- Earthquakes
- Tsunamis
- Cyclones/Storms
- Coastal floodings
- Riverine floodings
- Droughts
- Sea-level rise

What do the above hazards bring?

Excerpt from the WorldRiskIndex 2022
*World Risk Report 2022

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Natural Disasters-Impacts

What are the impacts from the hazards?

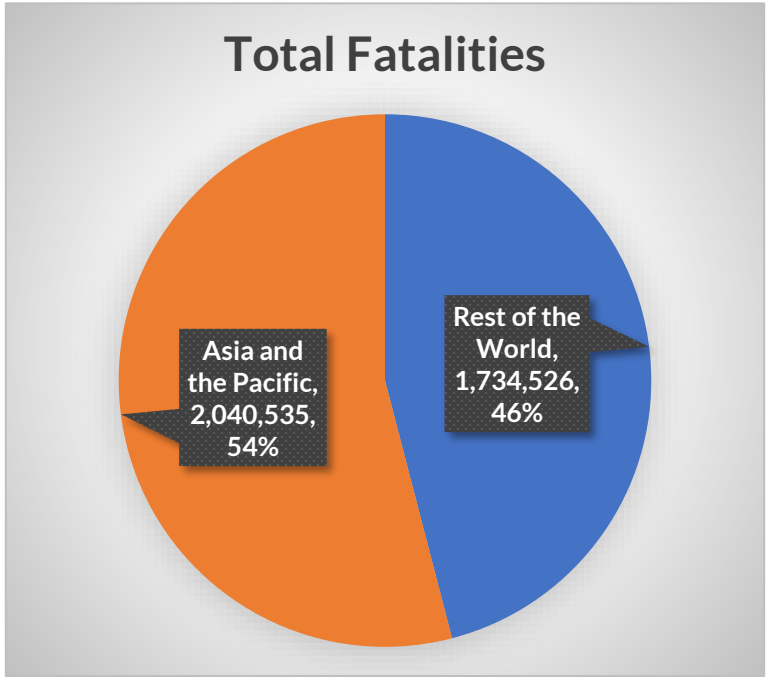
Impacts

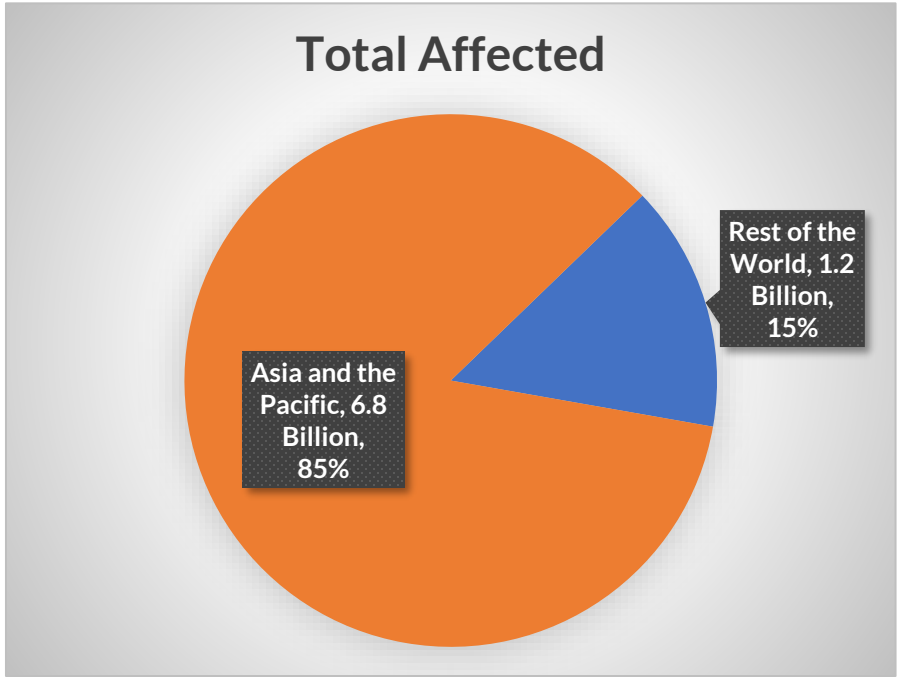
- ***Disaster impact***: the total effect, including negative effects (e.g., economic losses) and positive effects (e.g., economic gains), of a hazardous event or a disaster. The term includes economic, human and environmental impacts. (UNDRR)
  - Death
  - Injuries
  - Disease
  - Others (including negative effects on human physical, mental and social well-being)

- ***Disaster damage***: usually measured in physical units (e.g., square meters of housing, kilometres of roads, etc.), and describes the total or partial destruction of physical assets, the disruption of basic services and damages to sources of livelihood in the affected area.

Global Natural Disasters- Impact to Lives

- A significant number of people lost their lives from natural disasters
- The region only experienced 44% of the total disasters globally, but the impact on lives lost was notable



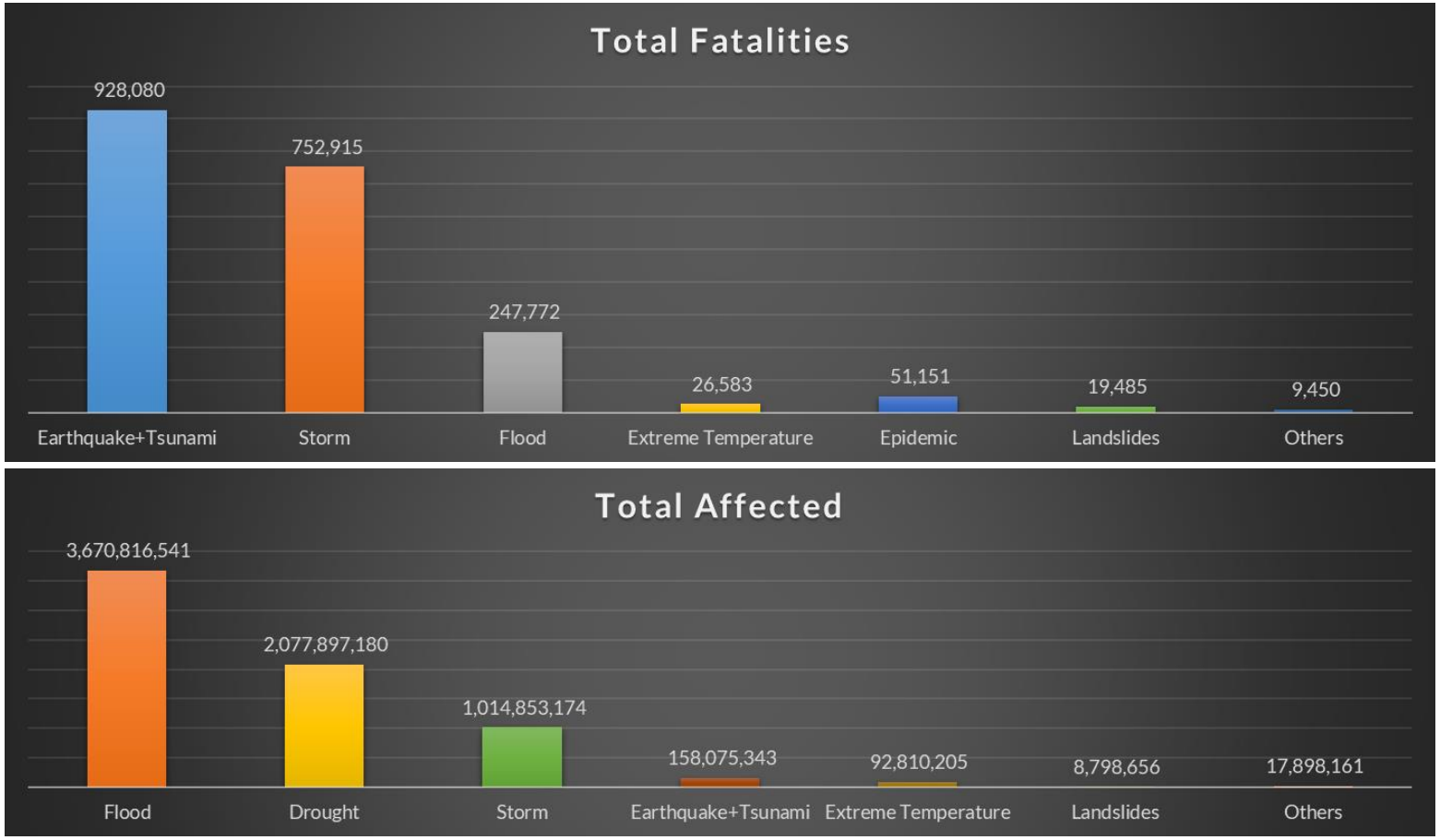


Total Fatalities and Affected from Natural Disasters (1970-2022)

Fatalities (or deaths) refers to persons confirmed as dead and persons missing and presumed dead as defined by EM-DAT.

Asia and the Pacific- Impact to Lives

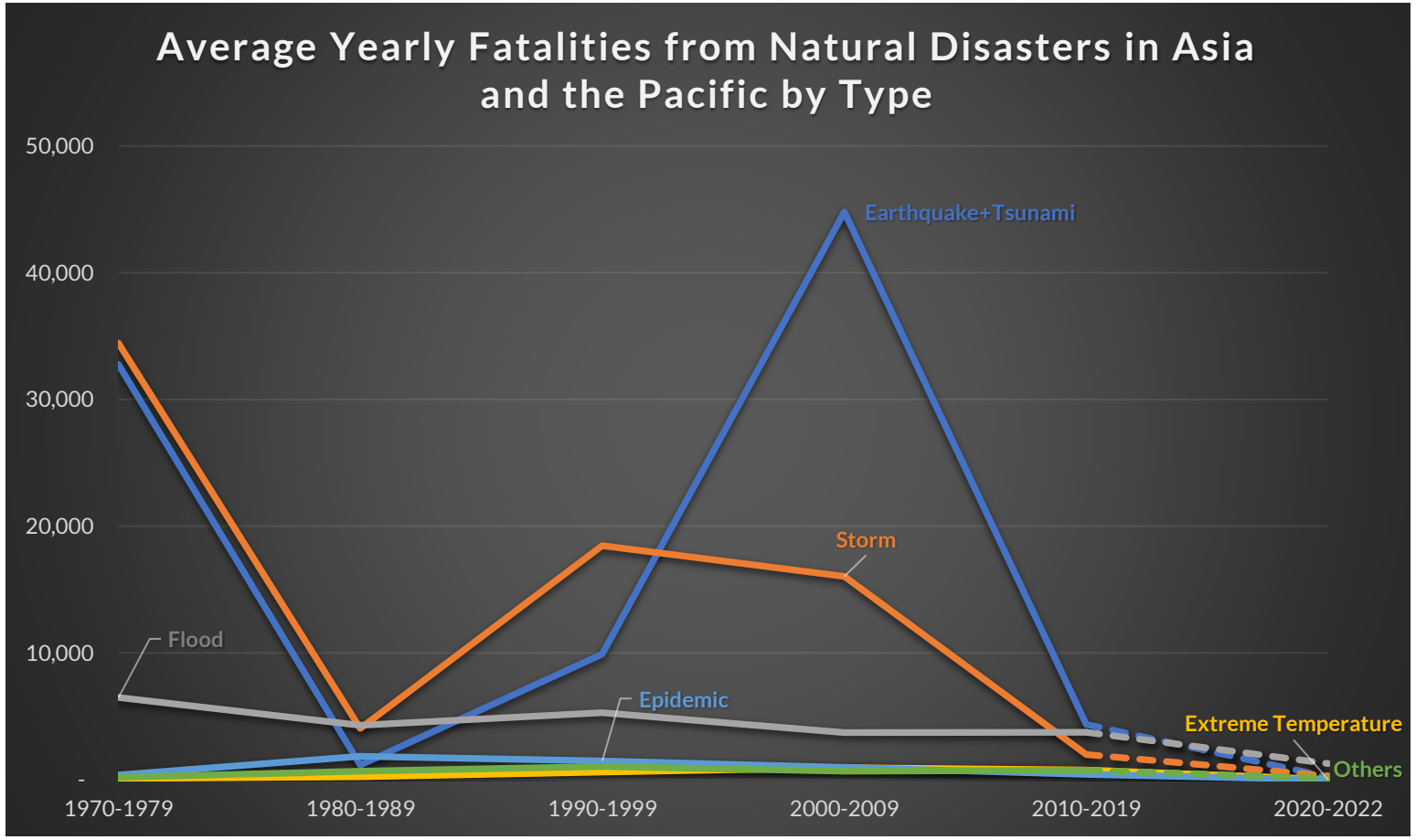
- Earthquakes and tsunamis were among the deadliest disasters – although they were not as frequent as hydrometeorological events
- Floods and droughts were not the deadliest but have affected the largest number of people



Total Fatalities and Affected from Natural Disasters in Asia and the Pacific by Type (1970-2022)

Asia and the Pacific- Impact to Lives

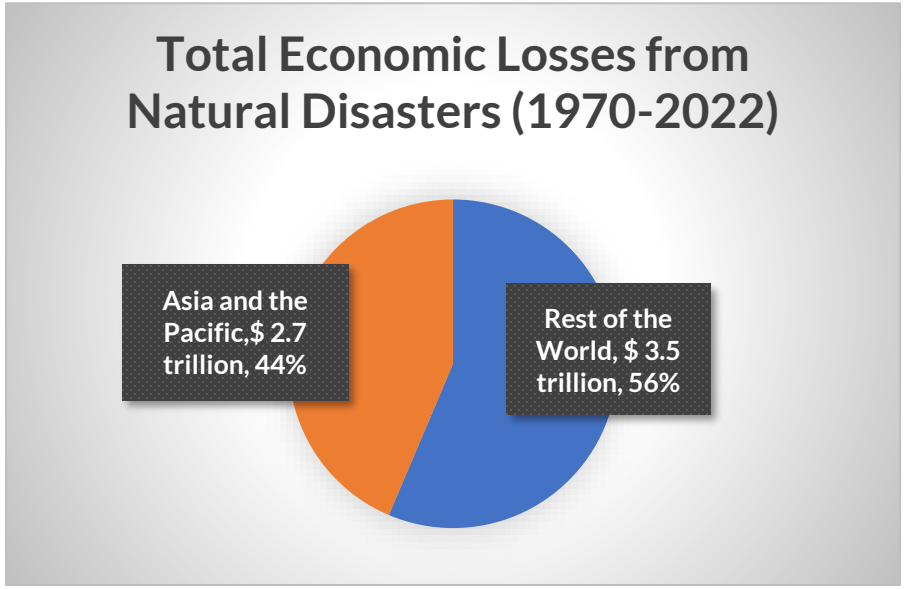
- Number of fatalities fell between 1970s and 1980s despite the increase in disaster occurrences
- Geophysical disasters has caused the recent large number of fatalities
- Years 2000-2009 show the impacts from some of the largest-scale earthquakes and tsunamis in recent times: 2004 Indian Ocean Tsunami, 2005 Kashmir earthquake and the 2008 Sichuan Earthquake

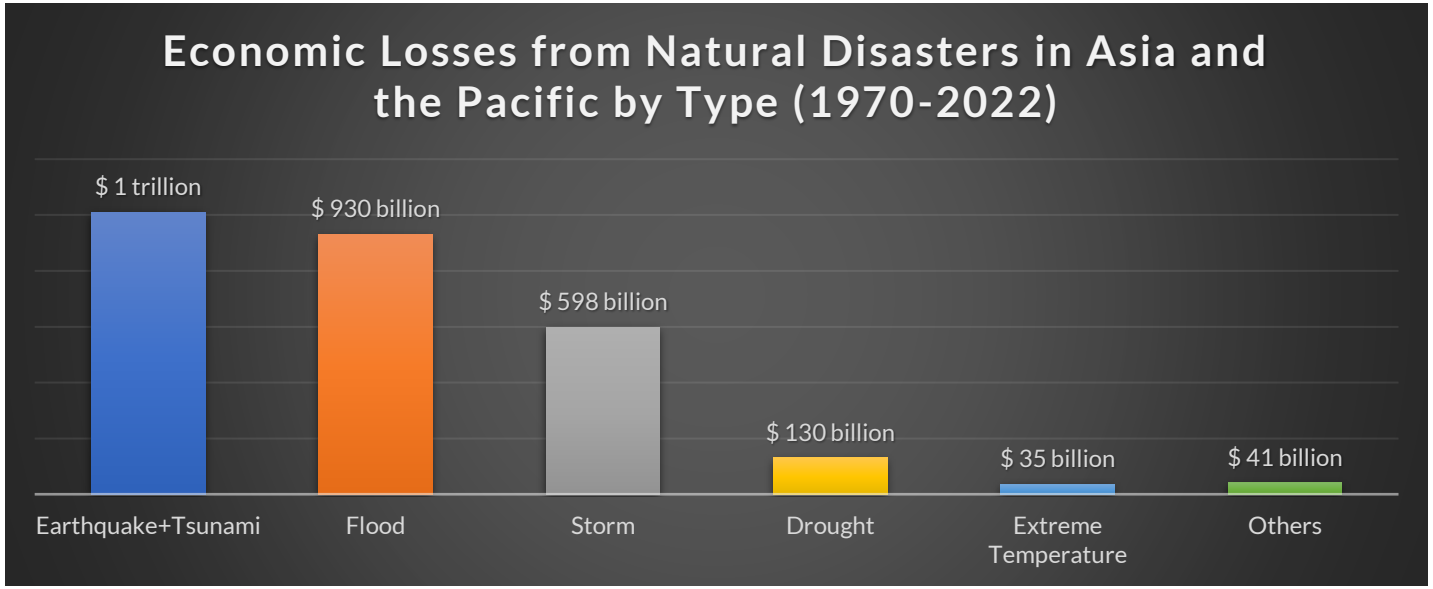


Each period in the figure represents yearly average of respective decade, but the last period represents yearly average of recent 3 years from 2020 (dashed lines).

Asia and the Pacific- Economic Impacts

- Asia and the Pacific reported $ 2.7 trillion of economic losses, amounting to 44% of the global total





- Earthquakes, tsunamis, flood and storms were responsible for 92% of the total economic losses in Asia and the Pacific

Examples of damages from hazards

Disaster Damages-Earthquakes + Tsunamis

- Damaged assets (houses, properties) and lifelines (roads, bridges)
- Damage to livelihoods and agriculture









Photo credits: FAO. 2021. The impact of disasters and crises on agriculture and food security: 2021. Rome. https://doi.org/10.4060/cb3673en

Disaster Damages-Storms

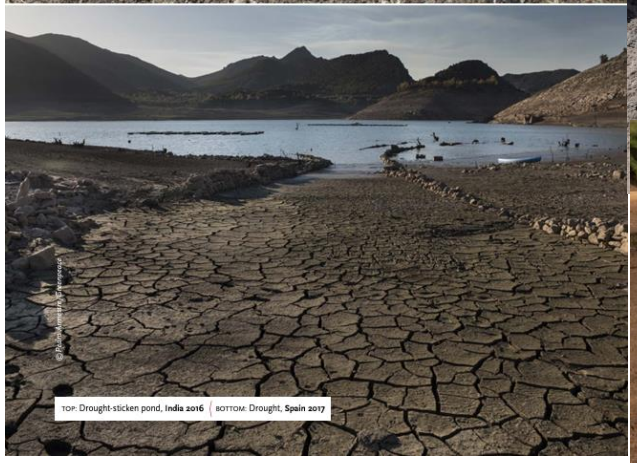
- Structures damaged by winds and floods
- Impassable roads due to debris
- Uprooted/downed trees
- Powerlines damaged
- Transportation affected

Disaster Damages-Floods

- Structures submerged in floodwaters
- Impassable roads due to floodwaters
- Coastal floods bringing debris
- Riverbank collapse
- Damaged agricultural lads

Disaster Damages-Droughts

- Damage to livelihoods
- Damage to agriculture and food supply
- Damage to ecosystem habitats
- Water supply rationed
- Possible outbreak of diseases



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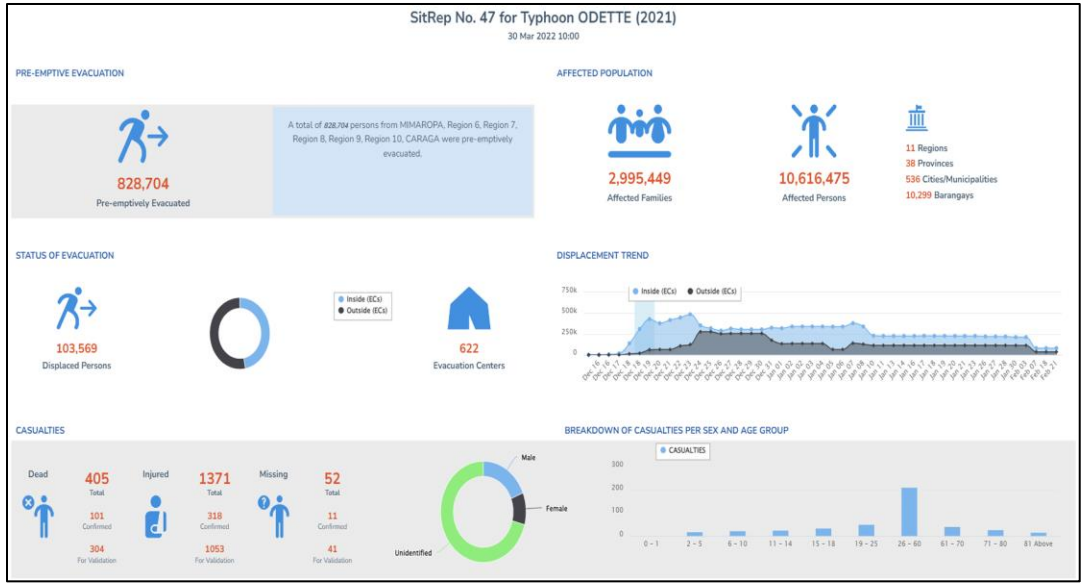
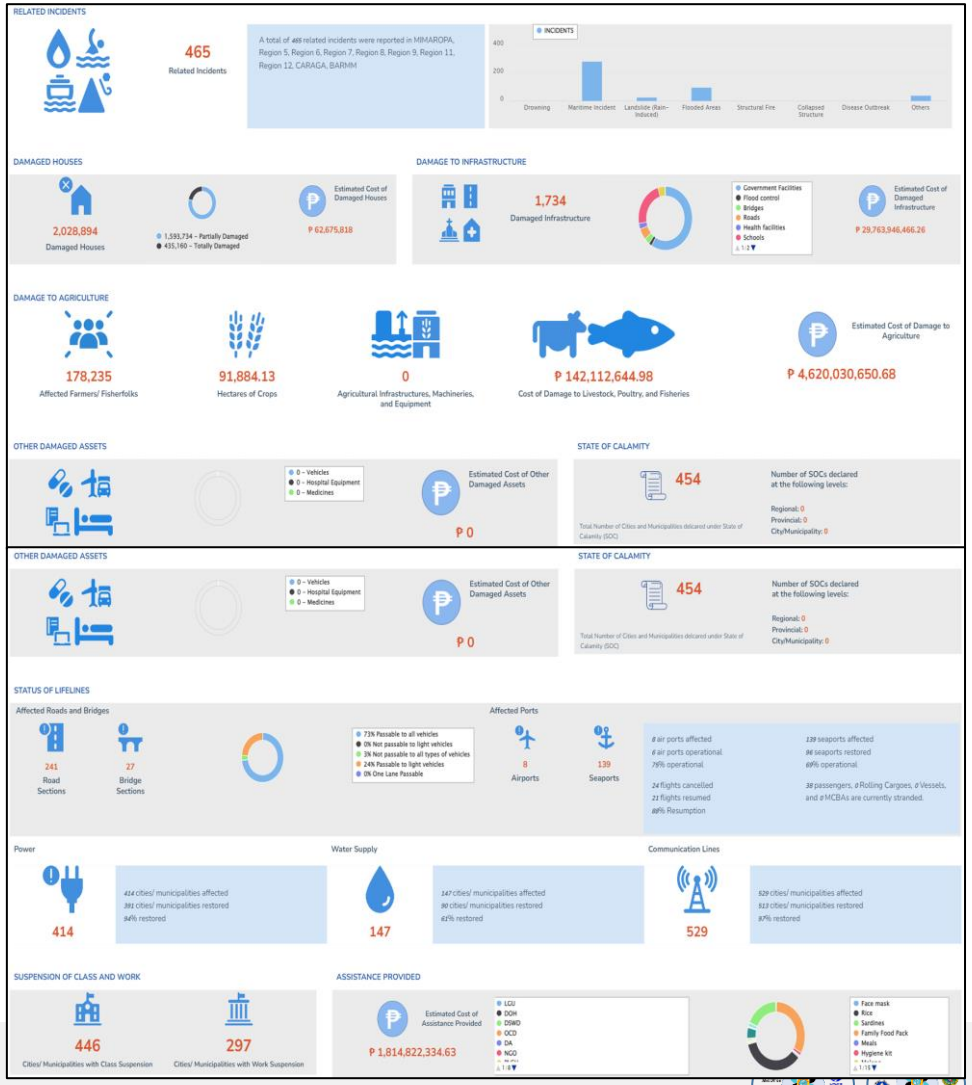
Impact reporting

Where can we access impacts information?

Country example-Philippines

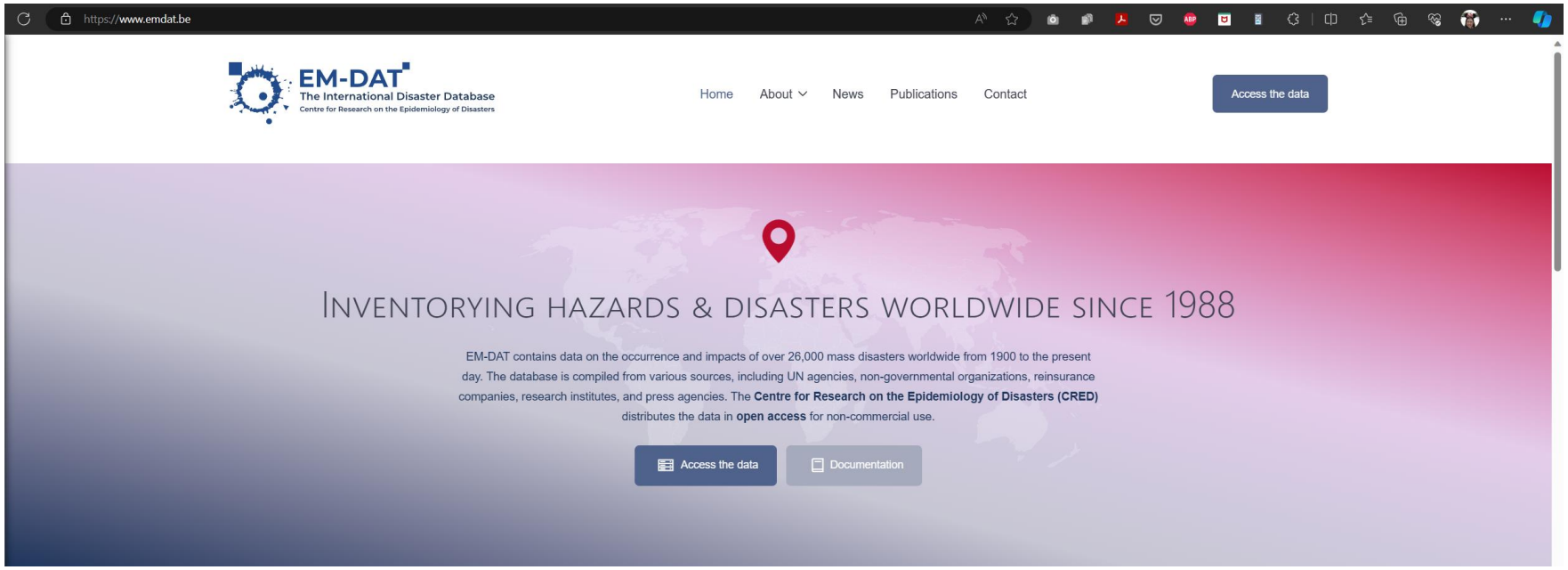
- Situational Report for severe weather events





National Disaster Risk Reduction and Management Council (NDRRMC) Philippines
https://monitoring-dashboard.ndrrmc.gov.ph/page/reports/situational-report-for-tc-odette-2021

Disaster Database-Open Access



- Emergency Events Database EM-DAT by Centre for Research on the Epidemiology of Disasters (CRED)
- https://www.emdat.be/

Thank you very much for your attention!

"tracking the sky…helping the country"

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