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TSUNAMI AND CRITICAL INFRASTRUCTURE

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TT Disaster Management and Preparedness Meeting, 28 February 2023



Critical Infrastructure vs Seven Global Target of SFDRR (2015-2030)

Substantially Reduce by 2030:

1. Global disaster mortality → 100,000 global mortality rate.
2. Number of affected people globally → 100,000 people.
3. Direct disaster economic loss in relation to global Gross Domestic Product (GDP)
4. Disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing *their resilience*

Substantially Increase by 2030:

5. Number of countries with national and local DRR (disaster risk reduction) strategies.
6. International cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework.
7. Access to multi-hazard early warning systems (MHEWS) and disaster risk information and assessments

Basic Service vs Critical Infrastructures at Tsunami Prone Area

1. Transportation:
 - Airport
 - Port
 - Coastal Highway and Bridges
2. Energy:
 - Power Plant
3. Health:
 - Hospital with nuclear treatment
 - Pharmacy factory
4. Education:
 - Schools
5. Many others ... Hotels etc

Needs for Tsunami DRR to Coastal Infrastructure

Tsunami Impact in Sendai Airport, Miyagi Pref.

- The Sendai airport (both airside and landside) was almost completely underwater, except for ATC (Airport Tower Control).
- No airplane can be seen, they have either been covered by the water or washed away by the tsunami waves.



Needs for Tsunami DRR to Coastal Infrastructure



Ports: Fishing boats and vehicles are carried by a tsunami wave at Onahama port in Iwaki city



Coastal Road and Bridges: Miyako City (Iwate Pref) overtopping seawalls and flooding

Disaster Risk Reduction to Coastal Infrastructure

Coastal roads and bridges:



Example: Tsunami and Earthquake in Palu, Indonesia

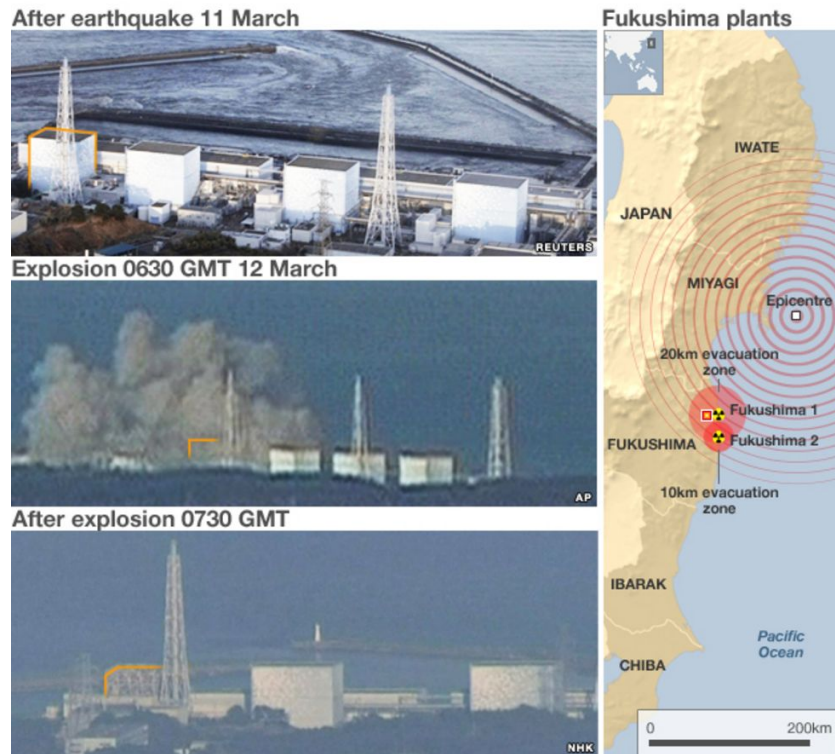
Coastal buildings:



Example: Phi Phi hotel and its surrounding on the devastated Phi Phi island, in southern Thailand 28 December 2004.

Disaster Risk Reduction to Coastal Infrastructure

Coastal power plants:



Example: Fukushima nuclear power plant

Coastal wastewater treatment plants:



Example: Coastal Wastewater Treatment Flood in Texas

Critical Point for Airport Resilience Intervention

1. Disaster Prevention in infrastructure planning:
 - Coastal Protection
 - Tsunami DRR Based Coastal Land Use Planning
2. Disaster Mitigation in infrastructure Design
 - Airport Terminal Building → Earthquake and Seismic resistant Building ← Building Code
 - Critical Facilities
3. Disaster Preparedness & Tsunami Early Warning
 - AOC – Airport Operation Center
 - ATC – Airport Traffic Control Tower
 - Evacuation Plan
4. Disaster Responses
5. Disaster Recovery

Existing: Get Airport Ready for Disaster

GARD
Get Airports Ready for Disaster



Help Each Other

Disaster Response Teams

* HEO is run by HR; additionally: many local projects in disaster response and recovery

Airport Ready for Tsunami

GARD
Get Airports Ready for Disaster

Prevention

TEWS: EOC

Mitigation: L1 & L2



Help Each Other

Disaster Response Teams

| TSUNAMI READY INDICATORS | |
|-------------------------------|---|
| Stage of achievement | |
| I ASSESSMENT (ASSESS) | |
| 1 | ASSESS-1. Tsunami hazard zones are mapped and designated |
| 2 | ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated |
| 3 | ASSESS-3. Economic, infrastructural, political, and social resources are identified |
| II PREPAREDNESS (PREP) | |
| 4 | PREP-1. Easily understood tsunami evacuation maps are approved. |
| 5 | PREP-2. Tsunami information including signage is publicly displayed. |
| 6 | PREP-3. Outreach and public awareness and education resources are available and distributed. |
| 7 | PREP-4. Outreach or educational activities are held at least 3 times a year. |
| 8 | PREP-5: A community tsunami exercise is conducted at least every two years |
| III RESPONSE (RESP) | |
| 9 | RESP-1. A community tsunami emergency response plan is approved. |
| 10 | RESP-2. The capacity to manage emergency response operations during a tsunami is in place. |
| 11 | RESP-3. Redundant and reliable means to timely receive 24-hour official tsunami alerts are in place. |
| 12 | RESP-4. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place. |

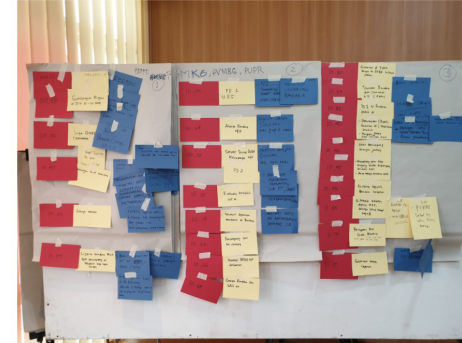
TR Indicators

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TSUNAMI READY YOGYAKARTA INTERNATIONAL AIRPORT

Intervention on Structural Design: Mitigation L1 and L2

Table Top Exercise and Tsunami Drill for the Biennial Tsunami Exercise of the IOWave 2020



Yogyakarta International Airport (YIA) Siap Jadi Area Evakuasi Bila Terjadi Gempa dan Tsunami

Jumat, 1 April 2022 19:41 WIB

Penulis: [Sri Cahyani Putri](#) | Editor: [Kurniatul Hidayah](#)



lihat foto



Tsunami Drill at the YIA, testing the Tsunami SOP and Tsunami Evacuation Shelter

Simulasi mitigasi bencana gempa bumi yang dilakukan di kawasan YIA, Jumat (1/4/2022)

Thank you ...