LESSON LEARNT ON THE IMPLEMENTATION TSUNAMI READY IN THE INDIAN OCEAN

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ICG/IOTWMS

THE UN OCEAN DECADE OUTCAME OF SAFE AND PREDICTED OCEAN

Predicted Ocean: Society understand and can respond to changing ocean condition

Safe Ocean: life and livelihoods are protected from ocean-related hazards

UN Secretary General Message on the WTAD 2021 "We can build on progress achieved – ranging from better outreach to tsunami-exposed communities around the world, to the inclusion of a Tsunami Programme in the UN Decade of Ocean Science for Sustainable Development ",

In June 2022, the UNESCO-IOC Assembly approved the establishment of the IOC Ocean Decade Tsunami Programme to contribute to the outcome 'A Safe Ocean' of the Ocean Decade, with the aim of **making 100% communities at risk of tsunami prepared for and resilient to tsunami by 2030 through the implemention of UNESCO/IOC Tsunami Ready Program**

TSUNAMI READY INDICATORS	
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 understod 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.

UNESCO/IOC TSUNAMI READY INDICATORS

TSUNAMI READY INDICATORS	
I ASSESSMENT (ASSESS)	**Understanding the Hazard and Risk**
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.	**Community Awareness**
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)	**Planning and Capacity**
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.	

In Practical:
1. **Implemented Simultaneously**
2. **Start from the "Easier"**

12 IOC-UNESCO Tsunami Ready Communities in the Indian Ocean

UNESCO Intergovernmental Oceanographic Commission

BMKG

INCOIS

INDIA

Noliasahi

Venkatraipur

INDIA:
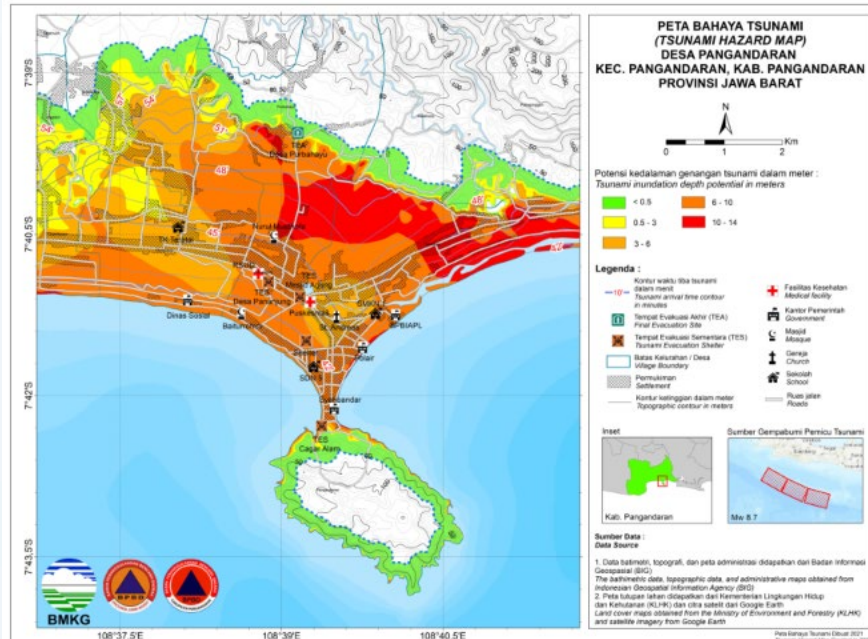1. Venkatraipur (August, 7th 2020)
2. Noliasahi (August, 7th 2020)

INDONESIA:
1. Tanjung Benoa Village (May, 28th 2022)
2. Glagah Village (December, 26th 2022)
3. Kemadang Village (November, 26th 2022)
4. Pangandaran Village (December, 26th 2022)
5. Panggarangan Village (November, 26th 2022)
6. Desa Tambakrejo (November, 26th 2022)
7. Kuta Mandalika Village (December, 26th 2022)
8. Purus Village (December, 26th 2022)
9. Lolong Belanti Village (December, 26th 2022)
10. Tapakih Village (December, 20th 2023)

Tsunami Ready

Tapakis Village

Purus Village

Lolong Belanti Village

Panggarangan Village

Pangandaran Village

Kemadang Village

Glagah Village

Tambakrejo Village

Tanjung Benoa Village

Kuta Mandalika Village

INDONESIA

IDENTIFYING HAZARD TO UNDERSTAND THE RISK

HAZARD, EXPOSURED, AND RESOURCE IDENTIFICATION

PETA BAHAYA TSUNAMI
(TSUNAMI HAZARD MAP)
DESA PANGANDARAN
KEC. PANGANDARAN, KAB. PANGANDARAN
PROVINSI JAWA BARAT
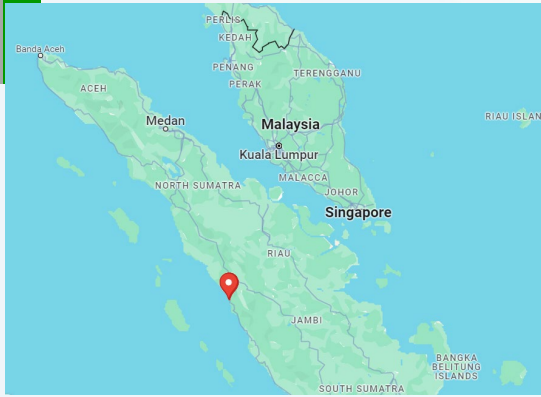
2. Estimating the exposed
- How many permanent residents living in this area?
- How many temporary residents? (Tourist/ Workers)
- Identify the disabilities
- Distribution of the exposed people

3. Identifying Resources
- Available local or national emergency budget,
- Public buildings that can be used as temporary shelters or for capacity– building workshops and meetings,
- local emergency operations or response plans for other hazards,
- social and volunteer organizations, local networks, parent associations of local schools, volunteer university students, etc

1. Developing Hazard Map of the Worst Scenario
- A map that illustrates tsunami potential impact in certain area,
- Used as reference for evacuation route planning and temporary as well as

The assessment indicators should be followed by Tsunami Evacuation Plan and Tsunami Emergency Operation Plan.

IMPLEMENTING HAZARD, EXPOSURE, AND RESOURCES IDENTIFICATION TO ACKNOWLEDGE THE RISK AND PLANNING THE PROCEDURE IN THE PURUS AND LOLONG BELANTI COMMUNITY

Purus and Lolong Belanty Community has the potential for earthquakes and tsunamis due to the location of its coast which is in the west, directly opposite the Mentawai-Siberut Megathrust earthquake source zone.


Mapping the Hazard

Identify Infrastructure Resources for community Evacuation Place

Identify the estimation of people at risk, and developing the Tsunami Evacuation Procedure

- Socialize the hazard
- The community of Purus and Lolong Belanti utilized the knowledge of the potential tsunami hazard, estimation people at risk, and the resources surrounding to develop **Tsunami Evacuation Procedure**

25 April 2023 Earthquake and Tsunami Warning in Padang

- On Tuesday 25 April 2023, 03:00:57 Western Indonesian Time, the M 7.3 earthquake occurred with a tsunami warning proposal, which further updated into M 6.9 with no tsunami warning proposal.

- It struck West Sumatra and North Sumatra for more than one minute. BMKG disseminated the earthquake information using Warning Receiver System (WRS) on the short and long text format, which blast through multimode mobile phone, public display, social media, telegram, WhatsApp, and others.

- The recognized communities Purus and Lolong Belanti were fast response and able to understand the tsunami warning.

- Responded well based on capacities built through 12 Tsunami Ready indicators

- Conducted self–evacuation protocols

- Well-aware of tsunami evacuation plans, routes, and evacuation sites

- Vulnerable people evacuated by their family and assisted by Local Disaster Ready Group

- Understanding about hazard in their area reduced panic.

- Although there was no significant tsunami (detected only 11 cm), community accepted action taken was necessary
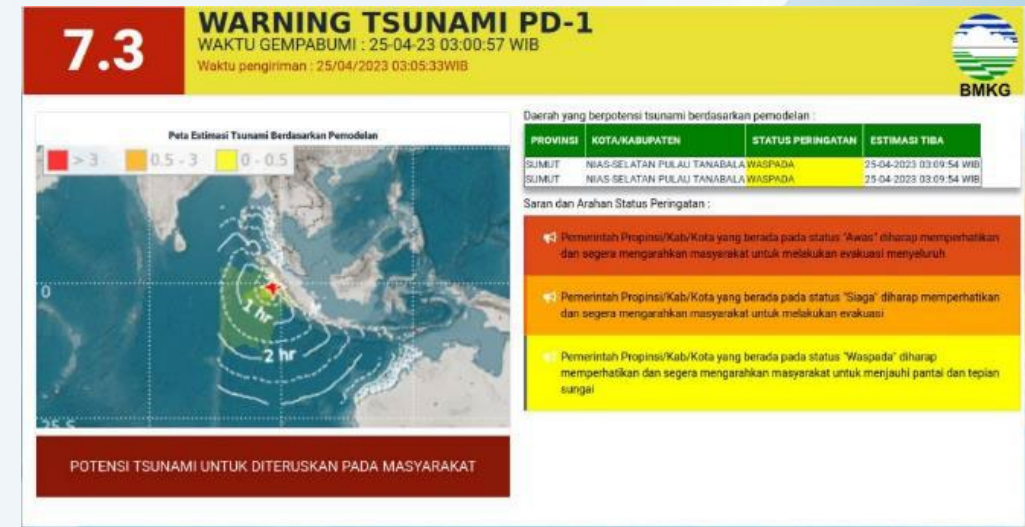
ENGAGING OTHERS PARTIES TO STRENGTHEN PREPAREDNESS CAPACITY

- The Yogyakarta International Airport (YIA) in South Java provides a shelter evacuation for the Tsunami Ready Community of Glagah, since the airport is the only infrastructure which has a high building in their neighborhood.

- The community of Tanjung Benoa Village-Bali has a support from the hotel to utilize the hotel's roof top for evacuation place.

Roof Top Hotel in Tanjung Benoa used by community as the evacuation place

Evacuation shelter for tsunami in the YIA that also used by the community surrounding as the evacuation place

DEVELOPING PREPAREDNESS AND RESPONSE CAPACITY

MOBILE APPLICATION FOR ACCESSING RAPID INFORMATION EVACUATION MAP AND

- The Community developed the evacuation map based on the tsunami hazard map

- To raise public awareness, Kuta Mandalika coastal community works closely with BMKG to develop the mobile application to help community accessing the earthquake and tsunami rapid information.

- The application is able to provide evacuation route and place for the community and tourist

Tsunami Evacuation Map of Kuta Mandalika
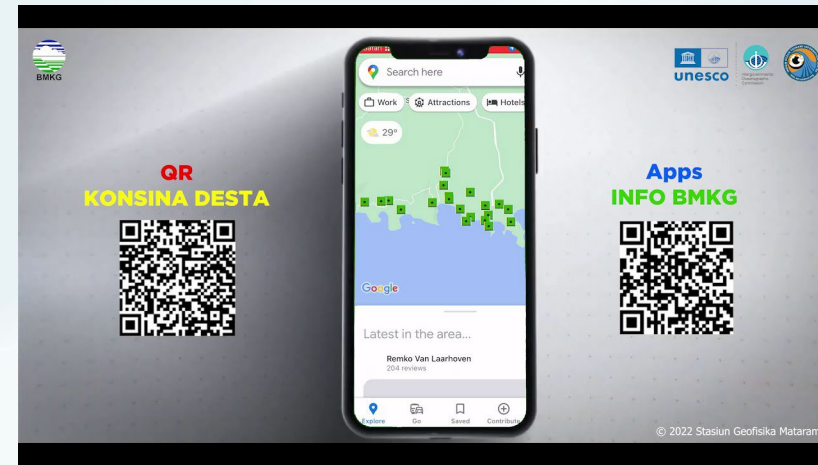
Kosina Desta, Mobile Apps for tsunami evacuation
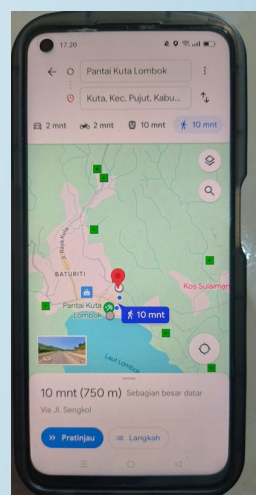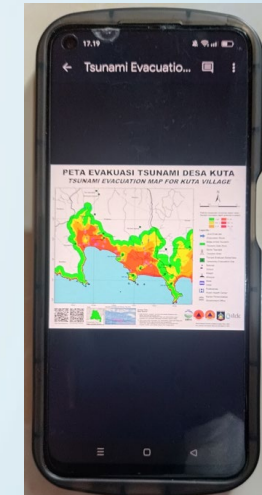
INNOVATION ON THE OUTREACH ACTIVITIES

Tsunami game board for youth to learn the tsunami ready in Panggarangan

Story Telling Workshop in Panggarangan

- To reach the youth's awareness, a suitable method of outreach activities should be considered:
  - Using game board to understand the concept of tsunami ready in fun learning approached
  - Story telling to sustain and enhance the awareness
  - Using fancy platform (t-shirt, calender) as media of education material to promote the awareness and preparedness
- "Door to Door" outreach activities in Purus and Lolong Belanti educate all families in the neighborhoods
- Socializing the tsunami ready during religious activities

Awareness Campaign on t-shirt

Annual Tsunami Drill Every National Preparednes Day (April 26)

- Building a culture of tsunami resilience through the continuous drill.
- National Disaster Awareness Day in Indonesia is remembrance every April 26. On that date, the Spirit of National Resilience is practice with conduct the emergency drill such as the earthquake, tsunami, and others.
- Tsunami Fun Drill and Run for Live

MOBILE APPLICATION FOR EARLY WARNING, EARLY RESPONSE

- Sirens for Rapid Information on Tsunami Alert is ANDROID based mobile phone application, aims to help the local disaster management office to disseminate the tsunami information and evacuation announcement as the early warning service to the coastal community at tsunami risk.

- SIRITA application will ringing when like a Coastal Tsunami Siren as soon as BMKG issuing the tsunami early warning potential.

MAINSTREAMING THE PROGRAM

THE COMMUNITY EDUCATION ACTIVITIES OF SEKOLAH LAPANG GEMPA (SLG) ON CONTRIBUTING TO THE DEVELOPMENT OF TSUNAMI READY COMMUNITY

- The SLG (Earthquake Field School) is a capacity building activity to enhance local government and community awareness and response
- Create Champions from LDMO, Community, Army, stakeholders related to the disaster management and response, School, community, private sector are involved.
- The scope of the SLG:
  1. Field Survey and advocating the implementation of the 12 indicators
  2. TOT Workshop of the SLG
  3. School Exercise

Tsunami Ready Community Activity: Strengthening Surrounding Community in the Industrial Estate
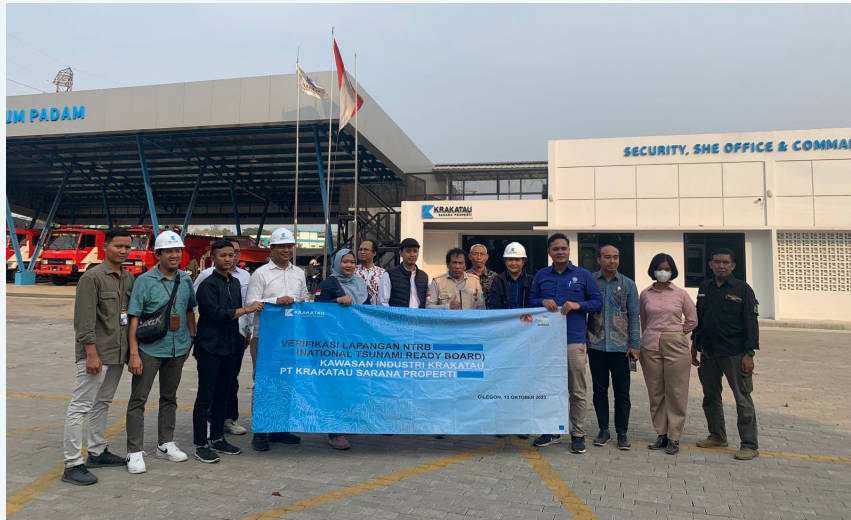
- One of the city in Indonesia that may impacted by the tsunami is the Cilegon city located in the West of Banten province. The city is the strategic area which has Cilegon Industrial estate. The PT Krakatau Sarana Properti (KSP) as the industrial community and fisherman surrounding there area now already completing the rapid information or communication mode, develop the Standard Operating Procedures and other communication chain, build the tsunami ready community, and evacuation infrastructures.
- Fisherman Community in the Cilegon Industrial Estate has facilitated the Siren, Assembly Point, and Evacuation Sign by KSP Industrial Company

Tsunami Ready Community Activity: Earthquake and Tsunami Evacuation Drill which involving the Surrounding Community

- Tsunami education and training in the airport must cover important aspects around tsunami, such as an introduction to the potential tsunami in the area, the history of tsunami that had occurred in the past, and the form of anticipation that must be given.

- In Bali and Yogyakarta International Airport the public education of earthquake and tsunami has been conducted, including distribute the tsunami ready book.
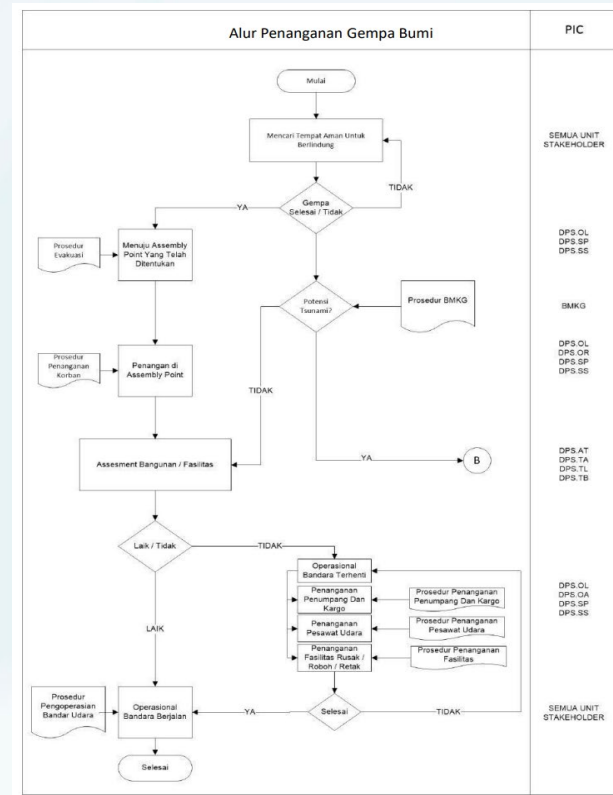
Airport Tsunami Management Plan
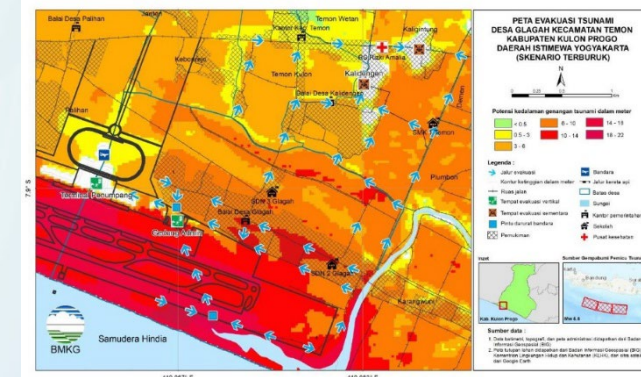
Airport Tsunami Evacuation Map

The Benefit of IOC-UNESCO Tsunami Ready Recognition Programme

- ❑ Strengthens tsunami preparedness of coastal communities
  - ‒Improved **assessments of Hazards**, Risk, Inundation, and Evacuation
  - ‒Improved **early warning systems/warning chain**, EOP, and EOC
  - ‒Improved/Increases **public awareness, understanding of tsunami threat, build preparedness, and ensures exercises**.
- ❑ Strengthen **preparedness for other hazards**

- ❑ Encourages as consistent and sustainable approach
- ❑ Earn Trust
- ❑ Leverage the community value
- ❑ Contributes to the UN Decade Program

CHALLENGES

- **Finding Resources**
  - Budget, Social Resources, Policy,

- **Create Ownership**.
  - Community should have the ownership

- **Sustainability**
  - Maintaining and improving the Tsunami Ready implementation

- **Monitoring Tsunami Ready**
  - Report regularly the Tsunami Ready Implementation

LESSON LEARNT AND REMARKS

- Engaging many collaborators (NTWC, NDMO, industry, critical infrastructure, hotel, University) to solve the limitations of existing end-to-end tsunami early warning information delivered to the targeted coastal community at tsunami risk.

- The champion (group of preparedness, community leaders) has a dominant role in carrying out public education and awareness activities.

- Developing various innovation of the preparedness activities outreach to approach all component of the communities Utilizing the existing program as platform to develop tsunami resilience

- Building a culture of tsunami resilience through the continuous drill and providing routine tsunami education will increase the community resilience.

- Optimizing the existing program as a platform for Tsunami Ready

- Expanding Tsunami Ready Implementation to speed up the Tsunami Resilience

THANK YOU
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