Tsunami Education and Awareness in Community: How to Improve For Enhancing Tsunami Warning and Community Response

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Outline

- Challenges in Tsunami Education and Awareness in Community:
  - Shown at many tsunamigenic events
- What and why went wrong?
- New approach for Tsunami Education and Awareness in Community?
  - Building culture of Safety
  - Sustainability in implementation program
  - Shifting Paradigm from Multi Disciplinary Approach to Trans Disciplinary Approach (TDA)
CHALLENGES
Indonesia Tsunami Early Warning System – Continuous Improvement

1. **Structure Component: Science and Technology**

2. **Culture Component: Socio Technology**

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**Denpasar Bali Tsunami Inundation Map**

**Denpasar Bali Tsunami Evacuation Route Map**
During Education & Awareness: “orderly manner”

Real Event: “chaotic and panic”

Effective TEWS?
Culture based TE 2006 \(\rightarrow\) attract
Tourism Industry Bali

- Critical Issues in Community Development prior TE:
  - External involvement
  - Local wisdom and/or local knowledge
  - Conflict area (socio culture, economics, politics, differences in SOP for downstream warning chain and/or emergency response, etc.)
  - VVIP presence during the program
  - Safety matter
  - Focal points to be included

10 Location of At Risk Community Development
Culture based TE 2006 → Positive Impact Bali Tourism Industry
11 Years after Tsunami Exercise → Tsunami Ready Hotel: Needs More Participation of the Hotels
TE ➔ Building Partnership among Government, Private Sector and People

National Tsunami Drill Banten 2007
Documentations of H. Rahayu, 2007
“I was watching television (MetroTV) when the earth swung. I went out, saw many people did so but no body escaped from their houses. I got back in my house, made a cup of coffee and back to the television and saw the running text of tsunami warning. I went out home in a hurry to escape. I had been outside for a while when the wave swept Me and brought me to the forest. I lost my consciousness till the next morning” (Fredi 23 years, Muntei Baru-baru - Mentawai).

(Doc Courtesy to A. Kodijat, 2012)
Local Challenges:
Chaotic Response @ Banda Aceh

Respondents (150):
76% evacuated – but only 1% evacuated to TVES

How to evacuate:
4% on foot
72% using vehicles

Reasons not to evacuate to TVES:
- Too close to coastal line
- No body run there
- Never think to run there
- Did not trust the building strength
- Too far from home
- Still have time to go to other place
- Others
- NA
Knowledge and Preference for Tsunami Evacuation
(sources: HP Rahayu and SR Keumala, 2013)

150 respondents

Respondents live close to TVES
- 100% who know what to do (Ya)
- 27% prefer TVES
- 73% prefer mosques

Respondents live far from TVES
- 87% prefer mosques
- 13% prefer own houses
- 5% prefer 2-story shop houses
- 4% prefer TVES

TVES
- TES (termasuk museum tsunami)
- Mesjid
- Ruko-ruko 2 lantai
- Rumah sendiri
Lack of Scientific Judgment: to Accommodate Social Behavior of Community at Risk

Factors Influence Evacuee Social Behavior
(sources: Harkunti P. Rahayu and Soraya R. Keumala, 2013)

- Characteristic of social demography structure
- Characteristic of the house and physical environment
- Perception to tsunami impact to their house
- Direct experience to 2012 evacuation
- Level of education, awareness and preparedness toward tsunami threat and protect themselves
- Other people behavior during evacuation
- People perception and trust to TVES, evacuation route and signage
Self Evacuation @ Pulo Aceh Island

April 11 2012

(Photo Courtesy to I. Rafliana, 2012)
How Tsunami DRR Influenced Social Capital in Enhancing Community Resilience – Case of Padang City

Seeing is Believing → Building Trust
Migration Issues – Facts Before TVES Built

Sources: PEER Science Cycle 3 - HP Rahayu, 2016

Empty Houses Before 2015 in Red Zone of Tsunami Inundation Area
Disaster vs. Migration
Sources: Sources: PEER Science Cycle 3 - HP Rahayu, 2016

“through migration → people attempt to avoid their disaster prone environment” (Foresight: Migration and Global Environmental Change, 2011)

Typology of People At Risk

**Choose to stay**

- Having capacity/ability to move out but decided to remain staying in disaster risk area.
- High Trust to Their Safety of Land and Environment

**Trapped**

- Having no capacity/ability to move out and willing to move out to safer place but decided to remain staying in disaster risk area.
- Low Trust to Their Safety of Land and Environment

People not to migrate out from the disaster prone area due to their low ability to move, which was affected by social demography, financial, physical environment, and political conditions.
Technical Guidelines & New TVES built in 2015 in Padang City
Existence of TVES: Increase Trust to Their Own Safety

Documentation of Sources: PEER Science Cycle 3 - HP Rahayu, 2016
Impact of DRR (TVES) on:

*Trust, Land Use and Land Price* → *Revise Spatial Plan*

Sources: PEER Science Cycle 3 - HP Rahayu, 2016

Socio Technology → Input for Local Policy and Regulation:
1. Disaster Management Plan
2. Spatial Plan (20 years)
3. Mid Term Development Plan (5 years)

Channel through:
1. Working closely
2. Multi Stakeholder and Inter-sectoral Participatory
3. Public Engagement using Media/Social Media
4. Personal networking
5. Opportunity to International Exposure

Before 2015 After 2015
Work Closely with Community
→ Recognize and Acknowledge Their Need

Trans Disciplinary Approach (TDA) in Tsunami Education and Awareness
An approach to curriculum integration which focuses primarily on the different disciplines and the diverse perspectives they bring to illustrate a topic, theme or issue.

A multidisciplinary curriculum is one in which the same topic is studied from the viewpoint of more than one discipline.

An approach to curriculum integration which dissolves the boundaries between the conventional disciplines and organizes teaching and learning around the construction of meaning in the context of real-world problems or themes.
Strategic Issues

- Need to improve TEWS downstream warning chain capability in *reaching the last mile*
- Need to improve TEWS downstream warning chain compliance with the *existing institutionalized legal frameworks*
- Need to improve TEWS downstream warning chain compliance with the *condition at the field*
- Identify *potential intermediate actors to be involved* in strengthening the capability of downstream warning chain to reach all the last mile
Intensive works done since 2005 by International, Nasional and Local Organization → however on the Education, Awareness and Preparedness was unsustainable → business back as usual

However Community Potential Focal Points (Intermediate Actors) recognized and Their Capacity could fill the missing link for ensuring to reach the last-mile:

✓ Local indigenous knowledge
✓ Masjid’s network
✓ Coastal Micro Business Communities, i.e. *Kelompok Usaha Bersama* (KUB)
✓ *Disaster Resilience Community Group -Kelompok Siaga Bencana* (KSB)
✓ Variations of media for Community Communication
Multi Stakeholders Participatory Process

Sources: PEER Science Cycle 3 - HP Rahayu, 2016
Improved Downstream Warning Chain of TEWS

Sources: PEER Science Cycle 3 - HP Rahayu, 2016

Identified Potential Intermediate Actors to Reach the Very Last Miles → proven to improve warning coverage from 71% to 100%
Public Engagement: FGD and TTX

Sources: PEER Science Cycle 3 - HP Rahayu, 2016

Results:
Technical recommendation on SOP improvement
IOWave 16: Testing Improved SOP able to Reaching the Very Last Mile

- 1,3000 people movement
- Community self support → meals etc.
- Involving: Communities, School up to The Very Last Mile
- Focus on 1 shelter
- Testing the Improved SOP
- Building more trust to TVES
Positive Impact ➔ National Disaster Preparedness Day April 2017

- 98,000 people movement
- 80 shelter ➔ observed
- Testing the SOP
- Testing the Infrastructures

Pemkot Padang Libatkan 98.000 Orang Meriahkan HKBN

Jumat, 7 April 2017 10:48 WIB

Pewarta: M R Denya Utama

Hotel Mercure Padang

Wali Kota Padang, Mahyeldi Ansharullah, (Antara)
National Disaster Preparedness Day April 2017
Concluding Remarks

- Need paradigm shift in Tsunami Education, Awareness and Preparedness to build Community Resilience: from MDA to TDA
- Disaster Education focus on building Culture of Safety
- Policy can be changed using good knowledge management and research
- Inspiration of using the field as living laboratory to recognize and solve the problem for saving lives
- Participatory process able to build trust
- Participatory process not only to make a positive change in policy but also action and implementation
- Public engagement in maintaining and optimizing the trust to DRR intervention
Merci Beaucoup ...